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ON THE ORIGIN OF CANCER*

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Why does a patient get cancer? That is a question which summarizes the problem of cancer and which must have often occurred to you when a patient presents himself or herself, apparently in good health except for some obscure and not necessarily painful symptoms, and on examination a malignant growth is found, sometimes in an early stage but possibly already in an advanced stage, although the patient may have presented himself as soon as he noticed that something was wrong. It is this insidious onset of cancer—striking a patient like a bolt from the blue—which has given the disease the air of a grim mystery.

Interpretation of Age Incidence

If I were asked in what respect the experimental investigation of cancer of the last fifteen years has most profoundly altered our outlook on the cancer problem, I would say it lies in the correct interpretation of the age incidence. The frequency of cancer increases with increasing rapidity as age advances. This can be readily seen from the following table, which gives the mortality rate per million people from cancer of all sites in decennial age groups in England and Wales:

Age Groups:	0–	15–	25–	35–	45–	55–	65–	75–
Cancer Mortality Rate ..	52	41	140	596	1,893	4,390	8,711	12,707

The death rate from cancer increases in almost geometrical progression. I know of no other disease which exhibits a similar phenomenon. This remarkable feature of the disease must therefore have a fundamental significance.

Formerly the insidious onset of cancer—the bolt from the blue—led us to believe that the origin of cancer begins with the first appearance of a malignant cell. This, as will be discussed presently, is due to an intracellular change by which a normal cell becomes transformed into a malignant one, and our attention was riveted to the investigation of this change as the one and only problem concerned in the aetiology of cancer. The fact that cancer occurs much more frequently in old people than in young or even middle-aged people was explained formerly by the assumption that the senility of the tissue is the predisposing factor in the origin of cancer. It was believed that in such senile tissue cancer arises suddenly. But the experimental investigation of cancer has shown clearly that it can be induced in a young or middle-aged organism as readily as, if not more readily than, in an old one; and, further, that when cancer has arisen the malignant cells soon grow in a young organism as readily as, if not more readily than, in an old one. This rules out senility as a direct aetiological factor in cancer.

Carcinogenic Agencies

When it became possible to induce cancer experimentally it was found that there are a great many different agencies capable of inducing cancer in such a tissue as the skin: chemical substances, such as tar or the pure organic substances synthesized by Kennaway and Cook; physical agencies, such as light, *x* rays and radium rays, heat, and even gross parasites.

All carcinogenic agents have this in common: that they induce cancer only after a lapse of time occupying a considerable fraction of the normal span of life characteristic for each species; and, furthermore, that this period of induction is much more prolonged with a weak carcinogenic agent than with a very active one. We have learned, further, *that during the prolonged action of these carcinogenic agents the tissue on which they act undergoes pathological changes, and that cancer arises within this altered tissue.* Now in man the bulk of cancer patients belong to the last half—even the last third—of the normal span of life. We can therefore conclude that *in man cancer arises as the* result of *carcinogenic stimuli acting over a prolonged period occupying a considerable fraction of the span of life;* and if this is so it follows, further, that *cancer does not appear as a bolt from the blue in a healthy tissue, but that as a result of this prolonged action of a carcinogenic agent the tissue or organ on which it acts undergoes pathological changes before cancer develops.* That the preceding existence of such precancerous conditions was not generally—and still is not generally—recognized is due partly to the fact that they need not be sufficiently severe to manifest themselves as a definite disease, especially when they develop in tissues or organs which are not readily accessible to clinical examination. They have, however, long been recognized in the skin, where the whole course of carcinogenesis is visible. The term "precancerous condition" was, in fact, coined forty years ago by dermatologists as the empirical result of clinical observations.

Two Phases of Development

We see, then, that the development of cancer, whether it arises spontaneously or whether it is induced experimentally, presents two phases. The first phase is a long

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preliminary one which we may call "*the origin of cancer.*" This extends over a long period of years amounting to a considerable fraction of the span of life—hence the characteristic age incidence of cancer—and it culminates in the sudden transformation of a few normal cells into malignant ones. During that phase in a more or less extensive though localized area of tissue a pathological condition develops, characterized by increased cellular proliferation in which subsequently cancer arises in a single cell or a small group of cells. The development of this precancerous condition depends upon the action from without on the cells of a given tissue of agencies of the most diverse nature—agencies which are called carcinogenic agencies. Carcinogenic agents may be substances foreign to the body acting locally where they are applied; they may be abnormal metabolites acting locally; or they may be formed in the body as normal metabolites—for example, oestrone, a hormone formed by the ovary but which produces its carcinogenic effect not on the cells where it is formed but on the cells of another organ remote from its origin—the mamma. But I emphasize the statement that during this preliminary phase the cells are being subjected to agencies acting on them from without.

Now the scene changes from the environment of the cell to its interior. When a cell within a precancerous area undergoes the transformation into a malignant cell a new race of cells arises. A change occurs *within* the cell which confers upon it the biological behaviour by which we recognize malignant cells and by which malignant cells kill the organism in which they have arisen. This biological behaviour characteristic of a malignant cell is its autonomous growth.

We pass now to the *second phase* of our problem—the *growth of cancer*; and I wish to emphasize that there is an essential and fundamental distinction underlying the mental concept of these two phases as two distinct and separate problems. The problem now is: What is the nature of the difference between the normal cell and the cancer cell? This difference does not consist, as is sometimes stated, in the acquisition of the property of growth. For the normal cells of the epithelium of the skin or of the intestine, of the lymphatic tissues, of the blood-forming tissues, and particularly of the cells of the embryo, all have this power to grow—that is, to form new cells. But this normal growth is subject to inhibitory and stimulating influences which regulate it in such a way as to ensure the well-being of the whole organism. The cancer cells are no longer subject to these stimulations and inhibitions. They are a new race of cells. They grow—that is, they multiply—sometimes rapidly, but sometimes very slowly, but always without any regard to the physiological needs of the tissue in which they have arisen and without regard to the physiological boundaries imposed after the growth of normal cells. By their destructive autonomous growth in a vital organ they kill the organism in which they have arisen. When a malignant tumour has appeared, either spontaneously or by experimental procedures, the cells of this tumour will continue to grow and form new tumours when placed into other perfectly normal animals. They can be kept growing *ad infinitum* by successive transplantations into normal animals in a perfectly normal environment and without any further application of the carcinogenic substances which have brought about their appearance.

Summarizing these experimental facts once more: we can transform a normal cell into a malignant cell by acting on it from *without* the cell; this phase represents the *origin of cancer*. But when this transformation has once occurred the malignant cell pursues its course in the absence of any agent acting on it from without. We are faced now with the problem of the *growth of cancer*. Whatever it is that drives the cancer cell on in its autonomous growth must reside within that cell, and that intracellular change is irreversible. The investigation of this second phase of the cancer problem is clearly much more difficult than that of the first phase. For our concern is now with subtle problems of cellular pathology, where even a rudimentary knowledge of cellular physiology is lacking. Essentially our task in investigating the growth of cancer is to search for differences between normal and malignant cells.

But it is not sufficient to discover differences, for these might be not the cause but the effect of the abnormal behaviour of malignant cells. It is necessary to establish differences which can account for the characteristic biological behaviour of malignant cells.

Growth of Cancer: Two Conceptions

Numerous attempts have been made to explain the growth of cancer by highly speculative conceptions. I shall content myself with mentioning very briefly two conceptions which are founded on a basis of experimentally established facts—namely:

1. That the intracellular change is represented by an alteration in the metabolism of the cell in such a way that it enables the cancer cell to obtain the energy necessary to maintain its life by a process of fermentation—that is, a process which does not require the abundant supply of oxygen required for the maintenance of life of the normal cell.

2. That the intracellular change is due to the presence of virus.

These two conceptions must not be regarded as mutually exclusive theories, but as working hypotheses having as their object to elucidate from different angles the autonomous growth of the malignant cell. Thus it is by no means unlikely that the presence of a virus within a cell might alter the metabolism of a cell, and it has in fact been found by Crabtree that in certain virus diseases, such as fowl-pox and vaccinia, in which there is a temporary cellular proliferation, the metabolism is similar to that characteristic of malignant growths. As this lecture is concerned with the origin of cancer, I must refrain from a discussion of these two conceptions. A detailed exposition of the conception of a virus being responsible for the growth of malignant cells has been given in recent years in papers by Peyton Rous and by W. E. Gye. Both the conceptions which I mentioned are working hypotheses, and if they are to be judged, as working hypotheses should be judged, by their results, they have been most fruitful.

What interests us from the point of view of the origin of cancer is the question how these conceptions are to be reconciled with the long preliminary phase necessary for the development of malignancy. That a fundamental and permanent change in the metabolism of a cell requires a long period of adaptation to abnormal conditions can be expected *a priori*. Less obvious is the explanation why a long preliminary period is necessary to enable a virus to enter a cell and transform it into a malignant one.

The Virus Hypothesis

The conception of a virus being responsible for the autonomous growth of cancer has met in the past with a strong opposition. This is due mainly to the fact that

most of the viruses with which we are familiar are the causes of highly contagious diseases, such as smallpox, measles, and foot-and-mouth disease. But it is not an essential feature of a virus infection to be contagious, any more than it is an essential feature of a bacterial infection. A virus is by definition a particulate pathogenic agent, capable of multiplying, foreign to the organism, and of a uniform size which is below the limit of microscopic vision but above that of the largest organic molecule known to exist in the normal cell.

It is clear that the conception of a virus in the cancer cell cannot alter the clinical features of the disease, but must adapt itself to them. Cancer is not a contagious disease. Even the fowl tumours in which a virus can be demonstrated are not contagious. Assuming then for the sake of argument that the growth of all malignant cells is due to a virus, how could we correlate this with the established facts concerning the aetiology of cancer, such as the existence of a long preliminary phase or the characteristic age incidence which is the statistical expression of this preliminary phase?

If we produce a tumour in the skin of a mouse by dibenzanthracene, or in the mamma of a mouse by painting the skin with a chloroform solution of oestrin, we clearly do not introduce thereby a virus. The virus must, therefore, have been pre-existent in the animal in a non-pathogenic condition. And since such tumours can be induced in a high percentage of animals, these viruses must be frequently present in a non-pathogenic condition. The treatment with dibenzanthracene or oestrone respectively would then appear to play the part of so altering the cells that the virus becomes pathogenic for them. This is by no means an extravagant assumption to make, for even with bacterial diseases there are well-known examples where either bacteria or their spores remain non-pathogenic, but become pathogenic when the tissues are subjected to abnormal conditions. The point I wish to make here is that even if the growth of malignant cells were due to a virus the prolonged preliminary phase in which the tissue undergoes a pathological alteration—the precancerous condition—would still remain a determining factor in the aetiology of cancer.

Quite recently Dr. Peyton Rous has published an account of experiments which illustrate this relationship in a very striking manner. There exists in rabbits an infective papilloma of the skin—which is due to a virus—the so-called Shope papilloma. This papilloma can be transmitted to other rabbits by introducing cell-free material obtained from such a papilloma into the scarified skin of a normal rabbit. After two weeks a papilloma begins to appear which may grow for several weeks and eventually regress; or it may continue to grow and form large masses. After an interval of many months a malignant tumour sometimes develops underneath such a papilloma, but no virus can be obtained from such a malignant growth, although it is present in the papilloma. Rous subjected the ears of rabbits to tarring lasting over periods varying from two to four months. As a result a number of warts appeared on the skin. If tarring is now discontinued the warts as a rule disappear gradually, and in order to produce a carcinoma in a rabbit tarring has to be carried on for eighteen months or more. But when Rous, after two to four months' tarring, introduced into the tarred rabbits the virus from the Shope papilloma by intravenous injection, the tar warts, after an interval of three weeks—the incubation period of the virus—began to grow with explosive rapidity, as if the virus had become localised in them, and after one or two months true carcinomata of the skin developed in the tarred ears.

A similar experiment, but with a different virus—the fibroma virus of Shope—has been carried out by Andrewes, Ahlström, Foulds, and Gye. The fibroma virus ordinarily produces fibroma-like connective-tissue swellings on subcutaneous injection into rabbits. These swellings eventually undergo spontaneous regression. But when this fibroma virus was injected intravenously into rabbits which had received previously an intramuscular injection of tar, connective-tissue swellings appeared at the site of the injected tar, and these swellings did not regress but grew progressively like true fibromata, and in two cases growths arose which had the characters of true malignant new growths of the connective tissue.

Experiments such as these demonstrate very clearly the existence of the two phases in the aetiology of cancer: the preparatory action of the carcinogenic substance (tar), followed by the effect of the virus on the cells which had been prepared for its reception and in which the virus becomes localized.

The Factor of Susceptibility

From the account which I have given so far it would appear that a malignant tumour develops whenever a carcinogenic agent is applied. But fortunately that is not so. I say *fortunately* because if my account was correct the incidence of cancer in man, especially in people of 60 years and more, would be much heavier than it actually is. The carcinogenic agents or stimuli are so numerous and various that it is difficult to see how one could avoid being exposed to them, and cancer would then appear as a normal concomitant of old age, like the greying of hair or any of the other signs of old age. Fortunately the effect of carcinogenic agents is heavily conditioned by factors which reside within the organism and which we may group together under the term "*susceptibility*." Ten years ago I drew attention to the significance of this factor by the following experimental observations:

If the skin of a large number of mice is subjected to a prolonged treatment with a weak carcinogenic agent, some mice will develop a skin carcinoma after about four months, others after six months, eight months, or even a year, and some individuals will remain completely free from cancer. Since these differences are found while the animals are kept under identical conditions, they must be due to a factor or factors of susceptibility intrinsic to the animals.

The importance of this factor has since been demonstrated experimentally by another technique. In mice it is possible, by prolonged inbreeding obtained by brother and sister mating, to produce strains of mice in which the genetic constitution of the individuals belonging to a particular strain is very nearly the same. If one breeds such a strain from a cancerous ancestry, it is possible sometimes to obtain a strain of mice with a very high incidence of spontaneous cancer in one particular organ—most commonly the mamma. In such a strain only the females develop mammary cancer after they have passed a certain age. In this way strains have been obtained in which 70, 80, and even 90 per cent. of all the females develop spontaneously cancer of the mamma. Conversely, it is possible to breed strains of mice in which the incidence of spontaneous cancer of the mamma in the females is very low, and may even be zero. If now the males of such strain are subjected to treatment with oestrogenic hormones, it is possible to induce mammary cancer even in males; but the readiness with which they respond to this hormone varies greatly in the different strains. In the males from a high mammary cancer strain, mammary cancer appears in 100 per cent. in from four to eight months; in males from a low mammary cancer strain in from eight to twelve months; and in males from strains in which the females never develop mammary cancer spontaneously the oestrogenic hormones may be completely unable to induce cancer, although given over a much longer period and therefore in larger amounts. Here again the origin of cancer is bound up with the existence of an intrinsic factor of susceptibility which is transmitted from parent to offspring.

Susceptibility is a deliberately vague term because our knowledge concerning it is as yet very incomplete. It comprises all those factors which condition the effect of the various carcinogenic agents. It may be concerned with the facility with which these agents induce the precancerous condition, or again it may be concerned with the facility with which the malignant transformation sets in within such precancerous conditions. Dr. E. Horning and I have shown recently, for a strain of mice with a very high incidence of mammary cancer, that the susceptibility to cancer of the mamma in this strain is due to an endocrine imbalance, particularly an imbalance between the oestrogenic hormone from the ovary and one or more hormones of the anterior lobe of the pituitary. Another important point is that an organism highly susceptible to the development of cancer in one particular tissue—the mamma—is not necessarily very susceptible to the development of cancer in a different tissue—the skin, for instance. In animals highly susceptible to mammary cancer the skin may, in fact, be resistant, and sometimes highly resistant, to the action of substances carcinogenic for the skin.

The conclusion we should draw from this line of work is that what is inherited is not cancer as a disease but a susceptibility to the development of cancer—that is to say, a tendency to respond with the development of cancer to carcinogenic influences which may be so weak as to be ineffective to the average normal organism—and, further, that this susceptibility is not a susceptibility to cancer generally, but is limited to one or at the most very few organs or tissues.

Remote and Proximate "Causes"

We have now completed our rapid survey of the origin and the growth of cancer.

It has been said by a distinguished physicist that problems are often found to be insoluble because they have been wrongly formulated. This is certainly true of the search for the *cause* of cancer. If I have been able to make myself clear to you, you will agree that the question, "What is the cause of cancer?" is meaningless. Does it refer to what I have called "the origin of cancer"—that is to say, the prolonged preliminary phase without which in the majority of cases cancer would not arise? Or does it refer to the growth of cancer—the sudden intracellular change which confers upon the malignant cell its power of autonomous growth and of metastasizing? They represent, as I have said before, two entirely distinct problems. If we wish to adhere to the use of the term "cause," we may distinguish them by calling the one the *remote causes*—that is, the origin of cancer (and these comprise not only the carcinogenic agencies but also the factor of susceptibility), and the other the *proximate cause*—that is, the growth of cancer. If we take as an example the skin, where the aetiology of cancer can be studied most readily, we know that cancer of the skin can be "caused" by, *inter alia*, light, *x* rays and radium rays, contact with tar, with certain organic hydrocarbons, and with certain lubricating oils. Here there are six different remote causes of skin cancer. They all lead up to the intracellular change, which we may assume is the same whatever the remote cause may have been, since malignant tumours produced by one carcinogenic agency, though differing *inter se*, do not essentially differ from malignant tumours produced by any of the other carcinogenic agencies. We may assume, then, that the *growth* of cancer of the skin is the same, no matter what the *origin* may have been; and, further, that the growth of cancer is the same for *all* organs and tissues, no matter what the origin may have been. But we should always bear in mind the mental reservation that this unity of the proximate cause is an assumption which we can only accept so long as there is no evidence to the contrary.

We see, then, that cancer from the point of view of the proximate cause—that is, its growth—may be regarded as a single disease. But from the point of view of the remote causes—that is, its origin—cancer is a multiplicity of diseases. From this second point of view each tissue has its own specific aetiology, different from that of other tissues; and we must even go further and admit that there may be different remote causes for each tissue. I have just given an example by referring to a number of remote causes of skin cancer. My colleague, Dr. Horning, and I have been able recently to bring evidence to show that cancer of the mamma can be due to—or, as I should say, has for its remote cause—an endocrine imbalance between the ovary, the pituitary gland, and possibly, also, the adrenal gland. But it does not follow that this applies to all cases of mammary cancer.

We should therefore discontinue the search for the cause of cancer, which is based on a naïve and crude simplification of the problem, and substitute for it the exploration of the causation of cancer, bearing in mind always that this comprises the two separate and distinct conceptions of the origin and of the growth of cancer.

Experimental Analysis of Carcinogenesis

In the experimental analysis of carcinogenesis we have now reached a point where the two factors—carcinogenic stimulus and susceptibility—can be introduced into the experiment in almost quantitative doses. Their relationship can be expressed, though somewhat crudely, by a simple equation applying to two known and measurable variables, A and B, and a constant, C, where A is the carcinogenic stimulus and B the susceptibility, while the constant C represents cancer. The equation is $A \times B = C$.

In that equation an increase in A involves a diminution in B, and vice versa—that is to say, the aetiological importance of the factor of susceptibility increases as the strength of the carcinogenic agent or stimulus diminishes. A weak carcinogenic agent which will elicit cancer readily in a highly susceptible individual will remain ineffective in an individual with a lower susceptibility, and where the susceptibility is very low even a strong carcinogenic stimulus may be ineffective. Moreover, when cancer develops in response to a carcinogenic stimulus applied to individuals of different levels of susceptibility it will develop more rapidly in those with a low susceptibility than in those with a high susceptibility.

Under experimental conditions we can therefore predict whether an animal will or will not get cancer of the mamma by controlling the two factors—carcinogenic stimulus and susceptibility. The carcinogenic stimulus is a pure chemical substance—oestrone—which can be given in accurately measured doses, while susceptibility can be varied by using different inbred strains of mice with a known incidence of spontaneous cancer of one particular organ.

Applications to Cancer in Man

When we try now to answer the question with which I opened this lecture—"Why does a patient get cancer?" by transferring these findings and conclusions to man, we meet at once with the difficulty that the two factors susceptibility and carcinogenic stimulus, which under experimental conditions were variable and known, now are variable but unknown. The equation reads now $X \times Y = C$.

We know that the patient has cancer and our task now is to search for shreds and patches of evidence concerning the part played by susceptibility and concerning the nature of the carcinogenic stimulus. This is clearly a difficult task. But it has to be faced if the advance in our knowledge of cancer obtained by the experimental study in animals is to lead to a control of the disease in man. That it is not an impossible task is shown by the knowledge obtained in recent years.

The part played by the factor of *susceptibility* has been made evident by the recent statistical investigations of Wassink in Holland and of Waaler in Norway on the familial incidence of cancer. I have reviewed the evidence in some detail in two recent papers, and I need only summarize it here. There are certain organs—the mamma, the uterus, and the prostate—in which there is a very high familial incidence which is restricted to one particular organ. The immediate female relatives of a woman with breast cancer show a remarkably high incidence of breast cancer, but not of cancer in other organs, nor do their male relatives show an abnormally high familial incidence. Similarly, the female relatives of a woman with uterine cancer show a high incidence of uterine cancer. In such tissues as the skin or the lip there is no very clear evidence of a high familial incidence, while some organs, such as the stomach, show a definite increase, though it is much less marked than for the mamma, uterus, and prostate. The extraordinary degree to which the incidence of mammary cancer is influenced by the family history is well illustrated in the accompanying diagram, which represents the proportion of cancer of the mamma in the total incidence of cancer in two populations—one the general female population, and the other the population of female relatives of patients with mammary cancer.

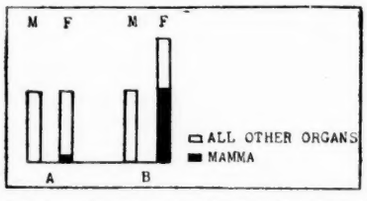

Diagram showing the comparative total cancer incidence in men and women, and the share of breast cancer in the total cancer incidence, in (A) the general population (Holland) and (B) the relatives of patients with breast cancer.

It is necessary to mention that even for those organs where the familial incidence is high only a proportion of the relatives—about 25 to 30 per cent.—develop cancer. Even so, these findings have a very important practical bearing on the early diagnosis of cancer, particularly in such organs as the mamma, uterus, and prostate. Thus the existence of a history of mammary cancer in the relatives of a middle-aged patient who presents herself with symptoms suggesting the possibility of a malignant growth in the mamma would, in my opinion, justify an immediate operation, even if the diagnosis of a malignant growth has not been established beyond a doubt.

A Preventable Disease

The search for the stimuli and agents responsible for the incidence of cancer in man is a most difficult task. We know that stimuli and agents carcinogenic for one tissue are not necessarily carcinogenic for other organs, and that even if we restrict ourselves to one organ the agents capable of eliciting cancer in that organ are numerous and diverse. Perhaps the greatest difficulty in this search is due to the conditioning influence of susceptibility. As a result of this, when two individuals are exposed to the same carcinogenic stimulus one may develop cancer while the other remains free from it. In spite of these difficulties we are now beginning to acquire a knowledge of the *origin of cancer* in man which will make cancer a *preventable disease.*

The recognition of cancer in man as essentially a preventable disease is, in my opinion, one of the most important results of scientific cancer research. It is based on the correct interpretation of the well-known characteristic age incidence of cancer in the light of the knowledge obtained by the experimental study of carcinogenesis to which I have referred earlier in this lecture—namely, that the onset of cancer is not a sudden one but is always preceded by a long period of induction, occupying a considerable fraction of the span of life of the species, during which the tissue in which the phenomena of malignancy eventually develop undergoes definite pathological changes. I correlated these two phenomena in a B.M.A. lecture in 1925; and a further study of this relationship emphasized its importance, for it meant that cancer was in principle a preventable disease. What is necessary now is an application of this knowledge to the study of cancer in man. We can now search for the origin of cancer by identifying the pathological conditions which precede the onset of cancer and their causes.

In certain tissues such as the skin, the tongue, and the vulva—that is to say, tissues which are readily accessible to inspection—the existence of precancerous conditions has long been recognized by clinicians, although the validity of such a conception was questioned by many pathologists. In any case, it was not recognized that these conditions represent special examples of a general phenomenon which is applicable to the vast bulk of the cases of cancer occurring in all organs. It is only in quite recent years, when our knowledge of the origin of cancer has made rapid advances, that an attempt has been made to correlate the incidence of cancer in organs not accessible to inspection with preceding disorders and diseases.

Clinical Correlations

A very striking example of such a relationship has been demonstrated recently. At the International Cancer Congress in Brussels in 1936 two physicians (Dr. Ahlbohm from the Cancer Centre in Stockholm, and Dr. Wassink from the Cancer Centre in Amsterdam) read two papers with the identical conclusion—namely, that cancer of the mouth, pharynx, and oesophagus in women is preceded with surprising frequency by a type of anaemia known as simple achlorhydric anaemia, which is associated sometimes with dysphagia and is then known as "the Plummer-Vinson syndrome." This type of anaemia occurs usually in women from an early age to middle age onward. It is characterized by achlorhydria and an early loss of teeth. The nails are frequently soft and spoon-shaped. In this condition the mucous membrane of the mouth, tongue, and hypopharynx is pale, dry, and atrophic, and there are often fissures around the mouth. The facial type is stated to be readily recognizable.

In Ahlbohm's figures, of 153 women with cancer of the buccal cavity and oesophagus, ninety-nine (65 per cent.) had suffered from simple achlorhydric anaemia with or without dysphagia. Here, then, is a disease, recognized as a separate entity more than twenty-five years ago and readily recognizable, which, after many years, is followed very frequently by the development of cancer in certain definite sites. There is at first sight no obvious connexion between the two diseases. This and the failure to recog-

nize that the origin of cancer has to be sought for almost always in some pathological condition pre-existing for many years are the reasons why the association between the two diseases has not been recognized until recently. This type of anaemia is readily curable by iron and hydrochloric acid, and since such treatment restores also the atrophic condition of the epithelium to the normal it is practically certain that the effective treatment of this type of anaemia will prevent the subsequent development of cancer which would otherwise occur in certain sites in two-thirds of the patients suffering from this type of anaemia. Although this relationship affects a number of women which is numerically small it is of fundamental importance, for it demonstrates clearly the possibility of elucidating by clinical investigations the origin of one particular form of cancer, from which its prevention logically follows.

I am convinced that a similar aetiological relationship can be found for the occurrence of cancer in many other organs. Thus Hurst has presented evidence that carcinoma of the stomach is frequently preceded by organic and functional changes—namely, a gastritis associated with either a hypochlorhydria or a hyperchlorhydria. Here, however, the relation between these disorders and the subsequent development of cancer is not so simple as in the example which I have just given. These preliminary disorders may, according to Hurst, give rise to a variety of gastric diseases. They tend to malignant disease of the stomach only in those constitutionally disposed to gastric cancer. The causes of gastritis are widespread and trivial, and consist largely of mechanical, thermal, or chemical insults to the gastric mucous membrane, resulting from such conditions as imperfect mastication, septic infections in the buccal cavity, dietetic irregularities—in a word, from imperfect alimentary hygiene. They can therefore be avoided.

Statistical investigations have given valuable information pointing to the same conclusion. The late Dr. Stevenson showed, fifteen years ago, that when the male population of England is divided into five social classes the incidence of cancer of all sites exposed to injury increases rapidly as we descend the social scale, but is approximately equal for the sites not exposed to injury. The exposed sites consist of the skin and the upper alimentary canal, including the stomach. By making a similar analysis for a Continental country (Bavaria) where suitable statistical material is available I could confirm Stevenson's observation. The incidence of gastric cancer shows, then, that the external agencies responsible for the development of cancer in the stomach can be avoided, and are avoided more successfully by the upper social classes than by the lower ones. Here, again, there is evidence that cancer of the stomach is to a large extent preventable.

I have already referred to the recent findings of Horning and myself that cancer of the mamma in a certain strain of mice is due to an endocrine imbalance between the ovarian hormone oestrin and an anterior pituitary hormone which is the physiological antagonist of oestrone. The imbalance can be restored experimentally by the injection of an anterior pituitary hormone—and mammary cancer can thus be prevented. We must, therefore, search for endocrine factors in the aetiology of mammary cancer in women. Here, again, one must not assume that all cases of mammary cancer have the same aetiology. The endocrine type is most likely to be found among women with a marked familial incidence of mammary cancer. Perhaps the statistically established fact that breast cancer is more frequent in unmarried women than in married women—and that, moreover, in women equally exposed to the risk of pregnancy it is more frequent in those women who are less fertile—may find an explanation in such an endocrine imbalance.

Need for a "Follow-down" System

The task of establishing in man such aetiological relationships is not an easy one. It is rendered more difficult by the lack of a suitable organization. We have to-day in many hospitals a "follow-up" system for cancer patients. This has as its object to trace the results of treatment. What we need now is a "follow-down" system for cancer patients in which the development of the disease is traced down to its origin. Such a system requires the careful clinical examination by a trained physician of a large number of cancer cases with special regard to their previous history. The relation between a certain type of anaemia and the subsequent development of cancer in certain sites was established by two clinicians working in two cancer centres. It would seem necessary, therefore, to establish in a few hospitals a separate department, under the control of a physician, through which all patients admitted to the hospital suffering from cancer of the internal organs, especially those which are numerically important, such as the breast, uterus, and digestive tract, must pass for an investigation into their previous medical histories.

But perhaps the greatest difficulty is the unjustifiable pessimism which pervades the medical profession concerning cancer. We are still being told by distinguished clinicians that cancer is a mystery, that we know nothing about cancer, and that we must wait until the cause of cancer is found—whatever that may mean—when the cure for cancer will automatically follow, which is by no means true.

Cancer is, unfortunately, a sensational disease; but the prevention of cancer is unsensational work. The physicians who prevent a hundred cases of cancer have less evidence to establish their success than the surgeons or radiologists who cure five, nor will they get for their achievement any credit or financial reward. The results of prophylactic work will become evident only after many years by a careful analysis of the national mortality statistics.

We often hear of proposals for an educational propaganda among the public for an earlier diagnosis of cancer; what is much more needed is an educational propaganda among the medical profession to establish in their minds the conviction that cancer is largely preventable and that every effort should be made to prevent it.

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THE ALLEGED EFFECT OF ACETYLCHOLINE ON IMMOBILIZED JOINTS

BY

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Neuburger and Scholl (1937a) have recently claimed that acetylcholine, given by subcutaneous injection, relieves or prevents the ankylosis and muscular atrophy which normally follow the immobilization of the limbs of experimental animals. In their experiments the knee-joint and ankle-joint of one hind limb in each of twenty rabbits were immobilized by means of a plaster bandage several layers thick, which extended from the great trochanter of the femur to the toes. The ten animals which served as controls showed ankylosis and a high grade of muscular atrophy after three to four weeks of continuous immobilization. The remaining ten animals received 10 mg. of acetylcholine subcutaneously every second day, until a course of eleven to fourteen injections had been made, when the plaster was removed. All the joints were found to be entirely free to passive movement; in active motion there was a slight sparing of the previously immobilized extremity, but this disappeared after a few hours. The muscles of the leg seemed fully normal and did not differ from those of the other hind limb.

In a more recent report Neuburger and Scholl (1937b) have extended their observations. A group of twelve rabbits were treated in the same manner, but the dose for injection ranged from 0.1 to 10 mg. It was found that the dose of 10 mg. gave the best results, and no effect was observed with doses below 3 mg. Six more controls were studied with this group, and all showed ankylosis when the casts were removed. Atropine did not counteract the beneficial effect. When prostigmin and atropine were given before each injection of the acetylcholine a dose of 3 mg. was found to be sufficient to prevent the ankylosis and atrophy. The authors state that, because of the similar action of acetylcholine and histamine on the blood vessels of the rabbit, the latter drug was given to a series of eight animals prepared in the same fashion: 1.5 mg. of histamine hydrochloride was administered subcutaneously every two days to a total of fourteen injections. A beneficial action was reported, but it was not so good as that obtained with the acetylcholine. In view of the practical importance of this suggested new action of acetylcholine it was thought advisable to repeat these experiments, following as closely as possible the technique for immobilizing the limb described by Neuburger and Scholl.

Twelve rabbits of different sexes, each weighing between 2 and 3 kg., were used. As in Neuburger and Scholl's experiments, the right hind limb was firmly wrapped in a bandage impregnated with plaster, six yards in length and one inch wide, extending from the greater trochanter of the femur to the toes. The animals quickly became accustomed to the cast, and, by using it as a crutch, were able to get about quite easily. They were allowed to run about freely in a small room.

Of these rabbits seven were used as controls. Two received a subcutaneous injection of 1 c.cm. of 0.9 per cent. saline each second day, and the other five the same quantity of a "dummy" solution, containing the same amounts of choline and sodium acetate as would be liberated by the hydrolytic decomposition of 10 mg. of acetylcholine. The five remaining rabbits were given 10 mg. of acetylcholine in 1 c.cm. of saline solution each second day. The injections were made beneath the skin covering the shoulder-blades. Some respiratory distress and collapse was observed to follow the acetylcholine injections, but the animals recovered rapidly, and in their general behaviour closely resembled the controls. All of the animals received from twelve to fourteen injections over a period of about four weeks, at the end of which time the casts were removed.

After the casts had been in position for some time they showed in practically all cases a tendency to become a little loose. The muscular atrophy resulting from the immobilization, which is one of the effects described by Neuburger and Scholl in their controls, makes it inevitable that the fixation should thus become less perfect with the progress of the experiment. This loss of complete immobility in the later stages must be encountered if the cast is initially applied as closely as is possible without impairment of the circulation in the leg and foot. In my series it affected equally the rabbits treated with acetylcholine and the controls. When the animals were finally anaesthetized with ether and examined more thoroughly, before being killed under the anaesthetic for further study, the opportunity was taken to examine the circulation in the neighbourhood of the joints by incising the tissues. In all cases free bleeding followed the incisions, showing that the circulation had been well maintained.

The results of the plaster fixation were the same in all the rabbits, whether treated with acetylcholine or with either of the control solutions. All showed changes of the kind observed by Neuburger and Scholl in their control rabbits, and none revealed any trace of the amelioration or prevention of these effects which they attributed to treatment with acetylcholine. In every case there was limitation of movement both at the knee-joint and the ankle-joint, and this limitation persisted under deep anaesthesia with ether. When, under the terminal anaesthesia, strong force was applied to produce flexion of these joints, crepitations were felt, and a snap, as of adhesions being broken, was often audible. In spite of the not quite perfect immobilization of some of the limbs the muscles in every case showed a pronounced atrophy of disuse, being very much smaller than the corresponding muscles in the other normal leg. All these effects were present, and without perceptible difference in degree, in the rabbits treated with acetylcholine as in the two groups of controls.

I am unable to suggest any explanation of the contrast between my negative results and those reported by Neuburger and Scholl, in which they describe a prevention by acetylcholine of the effects of immobilization so definite that they are able to study it quantitatively with graded dosage. I have thought it desirable to record my completely negative experience, since Neuburger and Scholl's publications may well lead to an application of this method in surgical practice. My own experiments suggest no likelihood of its success.

Summary

Neuburger and Scholl have recently reported that acetylcholine prevented the ankylosis and muscular atrophy normally resulting from the immobilization of the hind-limb joints of rabbits.

Their experiments have been repeated, but no differences between the control and treated animals, as described by these authors, could be demonstrated.

This work was done during the tenure of a Medical Research Fellowship of the American College of Physicians.

I wish to express my thanks to the Medical Research Council for allowing me the privilege of carrying out these experiments in the laboratory of Sir Henry Dale.

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GLASGOW EXPERIENCE OF INCREASED DYSENTERY PREVALENCE

BY

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During the past three years the annual number of dysentery cases registered in Glasgow has been increasing and has become relatively high. During the second half of 1937, too, the city, with 203 cases, shared in the reported country-wide increase in prevalence. I attempt here a brief review of some aspects of the prevalence of dysentery during these years and on previous occasions of raised incidence.

Annual Incidence

Dysentery became notifiable in 1919, when 117 cases were registered. During the nine years thereafter the annual number of notifications was small, often being less than twenty. In more recent years the number has been increasing, and has exceeded a hundred again on five occasions—namely, 1929, 119; 1932, 136; 1935, 135; 1936, 239; 1937, 272. The annual average over the whole period 1919-37 was 81.4.

OTHER DIARRHOEAL DISEASES

There has not been any apparent regular association between increased prevalence of dysentery and that of other diarrhoeal diseases. It is true that in 1919 and 1932 an increased number of deaths from diarrhoea were registered, that in 1935 enteric and paratyphoid fevers were more prevalent than usual, and that 1936 was a high year both for paratyphoid cases and for deaths from diarrhoea. On the other hand, deaths from diarrhoea were more numerous than usual in 1920, 1921, and 1926; also, the incidence of enteric fever was relatively high in 1920, and that of paratyphoid B fever in 1927, 1930, and 1933.

Seasonal Incidence

Reports from various sources regarding the seasonal incidence of dysentery differ widely. The years under special review here might be regarded as revealing some resemblance between the seasonal incidence of dysentery and that of the other diarrhoeal diseases. Deaths from diarrhoea and enteritis are highest in either the third or the fourth quarter of the year. Enteric infections are most frequent in the third quarter. Paratyphoid infections are less regular in this respect than typhoid; and, indeed, a large outbreak of paratyphoid B comprising 159 cases in Glasgow and forty-one other cases in neighbouring county areas occurred in the spring of 1936. The total seasonal incidence of dysentery during the past three years was as follows:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Home Infections ..	41	65	136	106	348
Institutional Infections..	116	13	59	110	298
Total	157	78	195	216	646

If it is held that the true seasonal tendency of the disease is obscured in the figures with respect to institutional cases by reason of special opportunities for spread, then dysenteric infections would appear to be most frequent in the third quarter, as suggested by the figures regarding cases infected at home. From the following list it will also be noted that of fifteen outbreaks of dysentery the numbers commencing in each quarter of the year were respectively 4, 0, 8, and 3. Of twelve institutional outbreaks included in the list the quarterly distribution of the onset was 4, 0, 5, and 3.

Outbreaks

The outbreaks recorded up to the end of 1936 and those now falling to be recorded for 1937 were as follows:

Date	Outbreak
1928 : Aug.-Sept. ..	7 fatal institutional cases among infants. 2 positive Sonne. Reported by Hay (1930)
1929 : Aug.-Nov. ..	51 cases and carriers in group of overcrowded tenements. 35 positive Flexner, including 9 symptomless persons. No common source detected. 93 other cases of enteritis investigated
1930	5 of 10 institutional cases positive Sonne
1933 : January ..	Small Flexner Z institutional outbreak
Aug.-Sept. ..	Small Sonne institutional outbreak affecting children
August ..	7 children positive Sonne of 12 cases which sickened 1-3 days after consumption of suspected ice-cream
1934 : March-April ..	5 of 13 institutional cases positive Sonne
1936 : January only ..	60 positive Flexner (X or Z) of 104 cases in large Poor Law institution, including 20 positive food workers. Total inmates, excluding staff, 1,343. 23 patients sickened in first 5 days after eating suspected meat pies on January 1; then 29, 27, and 24 in successive weeks. 10 aged patients died
September ..	9 positive Sonne cases associated with ice-cream—2 in family of vendor and 7 cases sickening 1 to 2 days after consumption
Sept.-Nov. ..	13 positive Sonne and 2 Flexner in children's institution
1937 : Jan.-March.	23 young children and 2 nurses notified from large general hospital; Sonne and Flexner W, X, and Z. Again :
Aug.-Sept. ..	23 young children and 2 adults notified from this institution, Sonne and Flexner W, X, and Y. Total cases notified in 1937 from this institution, 60, mainly Flexner; several of the foci untraced
September ..	9 men notified as cases of Flexner dysentery from ward in large general hospital, which later housed the big outbreak described below
Oct. 21-Nov. 4	Fever hospital staff outbreak affecting one doctor and 34 nurses, with 14 positive Sonne. Cases sickening on successive days—1, 2, 2, 2, 2, 3, 5, 5, 3, 4, 1, 2, 1, 0, 2. Possibly due to fresh fruit eaten October 20. Controlled by removing cases from nurses' home to special ward
Nov.-Jan., 1938	5 positive Sonne of 11 cases among staff and female patients in large mental institution. First case, missed, inmate of old standing. Good isolation accommodation. Notifications in 1938 figures
Nov.-Jan., 1938	94 cases and 12 carriers in large general institution with 86 positive, of whom 78 were positive Sonne. Described below. 42 cases included in 1937 figures. 386 other persons investigated, including 114 with loose motions. Total persons examined, 492

True Incidence of Dysentery

The above list sheds light on some factors in the frequently discussed disparity between the notified cases of dysentery and its true incidence. Of 121 positive findings in two outbreaks twenty-one were made regarding persons free from symptoms; and of 349 persons comprised in nine outbreaks only 219 yielded positive specimens. It therefore seems probable that despite the increased attention recently paid to dysentery many mild and many bacteriologically negative cases remain unnotified. Moreover, suspicion of dysentery may not be raised when cases do not occur in groups; and it is also known that investigation and notification are withheld in some cases that do incur suspicion. Other considerations tend to limit the extent of disparity between true and apparent prevalence. In connexion with two outbreaks regarded as comprising 157 persons, 207 contacts with loose motions were investigated with negative result. Also, in connexion with one outbreak regarded as comprising 106 persons, 386 contacts were examined with negative result.

Food-borne Infection

It will be noted that food has been incriminated or suspected as the vehicle of infection in respect of both types of bacillus and both in institutional and in non-institutional environments. Besides the two listed Glasgow outbreaks of Sonne dysentery attributed to ice-cream, a small county Flexner outbreak traced to ice-cream was investigated in the city laboratory in 1931. In 1926, too, a county outbreak of eighty cases of Sonne dysentery associated with a milk supply had been investigated in the city laboratory, as reported by Wiseman (1927) in the first record of the appearance of Sonne dysentery in epidemic form in the West of Scotland.

Institutional Infections

Institutional infections form a substantial and increasing proportion of the total number of cases, as will be seen from the following list:

Year	Institutional Infections	Home Infections	Total Cases Registered
1935	42	93	135
1936	111	128	239
1937	145	127	272

It will also be noted that the excess of total cases for 1937 over 1936 is accounted for by institutional cases.

Periods of high institutional incidence are of course not necessarily periods of high domestic incidence, because any one institutional focus may become enlarged owing to the special conditions existing in institutions. For example, in January, 1936, sixty-eight cases from institutions were registered, but only eight home cases were notified. Sometimes domestic registrations have been high without an associated increase in institutional cases. For instance, in the three years 1935–7 the following numbers of home and institutional cases were registered in September, the month with the highest total of home cases over that three-year period: 25 and 5, 28 and 6, and 23 and 16 respectively. In December, 1937, however, when the prevalence in other parts of the country was also notably high, there was a simultaneous notable rise in the number of home infections, which totalled twenty-eight, and of institutional infections, which totalled forty-four. On the whole some relation does probably exist between the two classes of cases. The third quarter was the one giving the highest figures for domestic registrations during the past triennium, and also for the onset of various outbreaks recorded over several years. It is indeed reasonable to assume that infection will be more often introduced into institutions when its prevalence in the general community increases.

Institutional cases appear to fall into two categories. In one a definite cause can be recognized—for example, contamination of food or secondary spread from a previous case. In the other are those institutional patients who sicken sporadically in the manner of cases ordinarily arising in non-institutional communities; and more than one type of endemic dysentery organism may thus participate in the prevalence. In respect of the relative frequency of institutional cases in this category dysentery differs from the enteric infections, institutional outbreaks of which usually are traceable to a definite source—a difference doubtless due to the greater general severity of enteric infections and to the longer duration of the ensuing carrier state.

Sex Incidence

The gross figures for all cases of dysentery without subdivision according to type of bacillus revealed no special feature with regard to sex incidence. For the years 1935–7 the sex distribution of the registered cases was as follows:

	Males	Females
Home Infections	187	161
Institutional Infections	140	158
Total	327	319

Age Incidence

The figures with respect to the age of incidence of both institutional and non-institutional cases confirmed the recognized high incidence of dysentery under the age of 15 and especially between the ages of 1 and 15. True dysentery does occur under 1 year of age, but with relative infrequency. Although a large proportion of cases of summer diarrhoea in America appear to be due to dysentery, Blacklock, Guthrie, and Macpherson (1937), working in Glasgow, state that in common with other British investigators they have rarely isolated dysentery bacilli in cases of infantile diarrhoea, apart from cases of frank dysenteric ileocolitis. The total figures for the years 1935–7 were as follows:

Age:	–1	–5	–15	–55	55+	Total
Home Infections	6	85	86	139	32	348
Institutional Infections	17	94	18	71	98	298
Total	23	179	104	210	130	646

Thus 306 cases occurred below the age of 15 and 340 cases above: home cases under 15 years of age actually outnumbered those aged over 15.

Fatality

Deaths certified as due to dysentery remain few. The age distribution of the sixteen persons who died in 1936 and of the nine who died in 1937 of dysentery was as follows:

Age:	–1	–5	–15	–55	55+	Total
Cases	14	132	76	169	120	511
Deaths	3	4	1	2	15	25

The disease therefore appears to be more serious among infants and among the elderly. The number of deaths during 1935 was five. Thus, during the three years of increased prevalence there were thirty deaths among 646 cases. During the years 1927–34 there had been thirty-two deaths among 619 registered cases: the case mortality rate has therefore not risen with the incidence. Dysentery, of course, also plays a part in deaths not included in such figures—that is, when it forms a terminal event in cases where death is certified as primarily due to pre-existing illness.

Organisms

A majority of the cases of bacillary dysentery are probably still due to the Flexner type of organism. The presence of Sonne dysentery in Glasgow was first recorded in 1928, when the outbreak reported by Hay and a few other isolated cases occurred. During the years 1929–36 positive specimens from Glasgow, according to the city bacteriologist, have numbered 413 Flexner and 278 Sonne. Positive Sonne specimens have exceeded positive Flexner specimens in the central city laboratory only in 1930, 1933, and 1936; and in 1936 a large institutional outbreak with sixty positive Flexner cases was investigated in a hospital laboratory. It is also of interest to note that, in 1936, of fifty positive specimens submitted from a town near Glasgow thirty were Sonne and twenty Flexner. Carter (1937) reported the results of his examination of eighty-eight Flexner strains isolated from Glasgow cases during 1936 and 1937. The staff of Dr. F. E. Reynolds, Stobhill Hospital, also recently examined ninety-five Flexner strains derived from the hospital. The results were as follows:

	V	W	X	Y	Z	WX	XYZ	Total
Carter	—	16	8	3	60	1	—	88
Reynolds	—	28	23	29	14	—	1	95

Although one type of organism usually predominates in any group, it is not uncommon to find different types and strains of these endemic dysentery organisms associated in a multiple focus. Examples of this association are included in the list of outbreaks given above. In 1934, too, four persons in a family were found positive for Flexner and two others positive for Sonne. In the autumn of 1932 four positive findings of paratyphoid B and three of Sonne dysentery had been made regarding seven persons living in an insanitary tenement. Also, in the large Sonne epidemic described below, a man unusually ill with positive Sonne dysentery was found to be a chronic urinary carrier of *B. typhosus*.

A Large Outbreak of Sonne Dysentery

The first large Glasgow outbreak of Sonne dysentery occurred in a big general municipal institution towards the end of November, 1937, and continued till the end of January, 1938. It therefore appeared at a time of exceptionally high country-wide prevalence of dysentery. In December forty-two cases were registered from this focus and only two from other Glasgow institutions. Home infections numbering twenty-eight were also registered in Glasgow in December. The seventy-two December cases thus constituted over a quarter of the year's 272 cases. Although the possible sources of introduction of dysentery into the institution were therefore more numerous than usual, it is to be remarked that of the ten Glasgow home infections registered in November and of the twenty-eight registered in December only one and four respectively occurred in the city division containing the institution. Moreover, apart from a few households whence patients were admitted suffering from frank dysentery, no infections were reported from the homes of infected patients, a large proportion of whose visitors would be derived from these homes. Also, no dysentery cases were registered from the homes of the infected staff members.

The epidemic assumed the form of two successive waves of infection. The following number of acute cases, all positive for Sonne except one positive for unspecified dysentery, sickened in successive weeks from November 20: 1937, 2, 20, 5, 4, 0, 9; 1938, 15, 6, 1, 1, 2, 0; making a total of 65 positive acute cases of Sonne and unspecified dysentery. Other positive findings were:

Cases admitted with dysentery: Sonne 6, Flexner 1.
Acute institutional infections: Flexner 1, Flexner W 1.
Symptomless temporary carriers: Sonne 8, Flexner 1, Flexner X 2, unspecified 1.
Total positive findings: 86, including 78 Sonne.

Acute cases numbered sixty-seven as detailed. Only twenty other persons were regarded as clinical cases yet gave negative specimens. These were not notified, but they would raise the total of infected persons to 106. The detection of so large a proportion of positive cases was doubtless due to the facilities for relatively prompt bacteriological examination. Negative specimens were also obtained from 114 persons with loose motions or incontinence and from 272 persons free from suspicious symptoms. Six of the positive cases ended fatally during December and January. These persons were all elderly, and suffered, moreover, from pre-existing illnesses.

The patient admitted with Flexner dysentery and two patients admitted with Sonne dysentery produced no secondary cases. Of the six patients admitted to the hospital wards suffering from Sonne dysentery four were associated with only six other cases that could be regarded as possibly attributable to the admissions, even when among the secondary cases is included one sickening two and a half hours after the admission of a dysenteric patient to an adjacent bed in an otherwise uninfected ward. In one of these groups the interval between the removal of one secondary case and the sickening of another was eight days.

Since many of the cases were clinically extremely mild it is not surprising that eight persons were classified as symptomless Sonne carriers. None of the carriers could reasonably be regarded as chronic; and indeed it is generally accepted that symptomless chronic carriers of bacillary dysentery are rare. Five of nine staff members found positive were symptomless. Neither the carriers detected among the staff nor those detected among the patients were so situated as to account for all the otherwise untraced foci of infection in the outbreak. The acute infections among the staff occurred after the outbreak had begun.

There was no definite evidence of spread of infection by food, milk, or water, but it was thought important that the milk supplies should be scalded in the wards and attention devoted to the methods of cleansing food utensils, especially milk containers, passing through the central kitchen and dairy premises. It will be noted that no incidence of Sonne dysentery was detected in these departments, all the members of the staff of which were examined bacteriologically.

The most noteworthy feature of this outbreak was the apparently sporadic way in which some of the affected individuals sickened within the institutional community. The first cases in the institution were female inmates of old standing in the chronic sick block. The disease sub-

sequently appeared in other non-admitting blocks of the institution. Similarly, acute infection reappeared in wards which had been free from dysentery cases for two to four weeks and in which the presence of carriers had not meanwhile been demonstrable. The following list gives some details of incidence in all sections of the institution.

Female chronic sick wards:

9 of 17 wards affected between November 20 and January 27. Inmates 192. Positive findings; 41, including 1 nurse.

Male chronic sick wards:

6 of 18 wards affected between December 3 and January 29. 183 inmates. Positive findings: 13, including 1 nurse and 1 maid.

Male mental observation wards:

90 inmates. 3 positive acute cases on December 3.

Male mental wards:

159 inmates.—4 positive acute cases, January 6–11.

Female mental wards:

222 inmates. 3 positive acute cases, January 3, 3, and 31.

Female mental observation ward:

27 inmates. No cases.

Hospital wards:

8 of 19 wards affected from December 12 to January 16. Total inmates, 523. Positive findings: 17, including 1 doctor, 7 admissions, and 6 possibly secondary cases.

Staff:

Total 643, of whom 233 lived in and 410 lived out. 5 positive findings—namely, 3 nurses (not employed in any infected ward), a kitchenmaid (Flexner X carrier), and a food porter to chronic sick block (Flexner carrier). 2 nurses, 1 maid, and 1 doctor are mentioned above. Of the 5 nurses infected 3 were symptomless Sonne carriers, so that 5 of the 9 staff members found positive were symptomless.

Total population of institution	1,629	2,039
Non-resident staff	410	
Persons examined bacteriologically, including those found positive	492	
Positive findings	86	

Summary

Dysentery registrations in Glasgow between 1919 and 1934 averaged 56.3 annually. Between 1935 and 1937 the annual total of institutional infections rose from 42 to 145 and the annual total of cases averaged 215.3. Some epidemiological aspects of these 646 registrations have been noted. Previous occasions of increased prevalence and sixteen outbreaks, including thirteen in institutions, recorded since the introduction of compulsory notification in 1919 have been adduced. Glasgow, with 203 cases, including seventy-two in December, shared in the widespread increased prevalence during the second half of 1937, and towards the end of that period experienced the onset of its first large outbreak of Sonne dysentery. Some details have been given of the incidence of the eighty-six positive findings (seventy-eight Sonne, including eight not associated with symptoms) made during this institutional outbreak. In the absence of case-to-case connexion between several foci within the outbreak it was considered important to devote attention to the methods of cleansing the ward food utensils handled by the uninfected staff of the central kitchen and dairy.

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CARCINOMA OF THE PALATE

HOW OFTEN DOES IT MASK MALIGNANT DISEASE IN THE MAXILLARY ANTRUM?

BY

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In the 1936–7 Statistical Report of the National Radium Commission the relatively low proportion of patients with carcinoma of the palate who have remained free from recurrence after treatment is commented upon. The report states that "the low proportion of patients with carcinoma of the palate who have remained free from recurrence is unexpected in view of the fact that the survival rate for this group approximates closely to that for the alveolus and that this group shows the highest proportion of patients free from glandular metastases when treatment was started. The figures given suggest that there is a tendency for tumours of the palate to spread further than can be easily recognized by clinical means, with the result that the tumour is often inadequately irradiated and thus tends to recur with greater frequency than tumours of the other sites." This particular problem was noticed some years ago at the Holt Radium Institute, and led to investigation with a view to finding, and remedying, the cause. Although at the time of the original investigation certain definite information was obtained, it was felt that the available cases were too few to justify publication of the inferences from their observation.

At the present time analysis of 167 cases of malignant palatal ulceration, and of 104 cases of antral carcinoma passing through a single clinic, is possible, and, in view of the comments in the Radium Commission Report, it would appear expedient that the conclusions to be drawn from that analysis should be placed on record. As a result of the investigation I suggest, and this article purports to demonstrate, that the tendency to recurrence after treatment of carcinoma of the palate is due to the fact that a large proportion of "palate growths" are really neoplasms of the antrum. It will be shown that, with certain limitations which will be discussed in their appropriate place, it is a wise generalization that every case of carcinoma of the palate must be considered and treated as an antral growth unless it has been proved not to be so. This generalization corresponds with those which nearly every medical student finds helpful with regard to malignant disease of the stomach, uterus, and rectum.

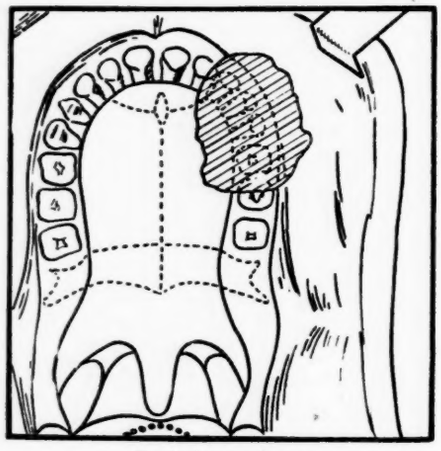
Material for Study

The material upon which this analysis is based is a group of 167 cases of palatal neoplasm and 104 cases of malignancy involving the maxillary antrum, partly included in the 167. Only those cases in which the palate was the site of major involvement have been considered. The patients were referred in part by general practitioners and in part by the surgical consultants on the out-patient staffs of the general hospitals in the area served by the Institute. In fairness it should be stated that failure to recognize the antral involvement of many of the palate tumours was not restricted to the former of these two groups.

The term "malignant disease involving the maxillary antrum" has been chosen to avoid any implication that it is considered that all, or even the majority, of the

tumours reviewed necessarily originated in the antrum. The investigation was undertaken to obtain information for the purpose of improving the results of treatment of malignant palatal ulceration. From a treatment point of view it matters little which side of the palate was first involved if both sides are involved at the time the patient is treated, since both sides have to be dealt with in any case. The majority of palatal growths could be grouped either as "anterior" or "posterior," although every part of the palate was represented in the cases studied. The posterior growths were usually associated with soft-palate ulceration, and frequently with extension on to fauces and tongue. They formed a group which a certain type of radium implantation (referred to in the Institute as a "tongue-pterygoid implantation") was generally successful in curing locally. Glandular involvement was usually the reason for eventual failure to cure, and many of the patients had involved glands when first seen.

The "anterior" group were found to involve the palate, upper alveolus, sulcus between cheek and alveolus, and sometimes the cheek in the neighbourhood of the



Typical antral site

alveolus. The actual site of this lesion was fairly constant, being about the junction of the middle and anterior thirds of the alveolus. Glandular involvement was rare, except as a late event. Local treatment of the obvious lesion was often followed by recurrence involving the maxillary antrum.

The factors which determined a final diagnosis of antral involvement may be summarized as follows. In the majority of cases the diagnosis was made before treatment, by radiographic demonstration of bone destruction. In others the diagnosis was arrived at only after failure of local palate treatment had been followed by recurrence accompanied by bone destruction revealed on *x*-ray examination or presentation of an obvious tumour eroding through another wall of the antrum.

Typical Antral Site

For convenience the anterior situation just described will be referred to as being in the "typical antral site." It may immediately be questioned whether this term can be justified. In Table I 167 cases of malignant ulceration of the palate are analysed with regard to site and antral involvement.

TABLE I.—*167 Palate Growths Analysed According to Site and Antral Involvement*

Total number of cases with ulceration of palate	167
A: Ulcer in typical site	96
Typical site ulcers involving antrum	91
B: Ulcer not in typical site	71
Non-typical ulcers involving antrum	1

The table shows that of ninety-six typical site lesions ninety-one at some period involved the maxillary antrum (94 per cent.), whilst of the rest only one in seventy-one (1.4 per cent.) did so. There can be no doubt that these figures justify the term.

The textbook description of antral malignancy usually given is of a history of nasal discharge and haemorrhage, often associated with pain in the maxilla, and trismus. There may or may not be nasal polypi. Later, as the tumour increases in size, there is extension beyond the walls of the antrum. A tumour presents most frequently in the malar region, orbit, or nose, but it occasionally occurs in the nasopharynx or the palate. Not infrequently several of these sites are involved. In actual clinical experience, however, it is very often the presence of one of these obvious tumours that is the immediate cause of the patient's decision to take medical advice. The obvious lesion results in a diagnosis of carcinoma of the nose or rodent ulcer of the inner canthus or epithelioma of the palate being made and treatment for this condition being instituted.

In Table II all the cases of maxillary antrum malignancy seen in the clinic are analysed according to the anatomical sites obviously involved.

TABLE II.—*Site of Obvious Involvement in 104 Antrum Cases*

Site	No.	Percentage
Intra-oral only	71	68.5
Both intra-oral and extra-oral	21	20
Mouth therefore involved in	92	89
Extra-oral only: Nose, 4; orbit, 1; malar, 4; more than one site, 3	12	11.5
Malar swelling	20	19

The heavy preponderance of visible mouth lesions over extra-oral involvement in this group of cases is so obvious as to require no further stressing. Consideration of the incidence of face swelling shows that in only twenty out of the total of 104 cases was this visible. Only two of these are found in the "missed antrum" group.

It may be inferred from these two tables that antral malignancy usually involves a typical part of the palate, and that practically every palatal ulcer in that site involves the antrum. The cases forming the background of this analysis do not bear out the usual view as to the common picture of antral neoplasm. Malar involvement is comparatively rare, whilst the palate is involved in 89 per cent. of the cases. It may be argued in reply that because the cases were referred for radiation therapy they were presumably advanced ones, and that consequently the typical picture was distorted. The infrequency of visible involvement of the malar region even in the obviously late cases, however, suggests that this is not the explanation.

The Incidence of Missed Antrum

It has been the custom in the Institute to refer to the cases which have been proved to involve the antrum, although originally diagnosed as some other condition, as "missed antrum." These cases fall naturally into two groups: (1) those which were recognized on first examination in the radium clinic although referred with a different diagnosis; (2) those not recognized until treatment for the first-diagnosed condition had been followed by recurrence. It is necessary in studying these missed antra to consider two proportions. First, there is the proportion of the total antral cases which were missed;

secondly, there is the proportion of the total palate cases which were in fact, or could have been, missed antra.

TABLE III.—*Analysis of Missed Antra in Relation to Total Antral Cases*

Total antra analysed	104
Total referred with misdiagnosis	70
(*a*) Recognised here but missed elsewhere	55
(*b*) Not recognized at all till recurrence	15

Table III shows that in seven years seventy possible missed antra have passed through a single institution concerned with general malignant disease. This figure represents 67 per cent. of the total antra seen. Of these seventy cases fifty-five were recognized in the clinic here, but fifteen were not.

TABLE IV.—*Analysis of Missed Antra with Palatal Lesion*

Total palates analysed	167
Total involving antrum	92
Total referred with misdiagnosis	64
(*a*) Recognized here but missed elsewhere	51
(*b*) Not recognized at all till recurrence	13

The two cases which were not recognized till recurrence took place, and which appear in Table III but not in Table IV, were diagnosed and treated as rodent ulcer of the inner canthus and as carcinoma of the nose respectively.

When both Tables III and IV are considered it is seen that, while 67 per cent. of all the antral cases were misdiagnosed before reference to this clinic, 91 per cent. (64 out of 70) of the errors occurred in cases with palatal involvement. I submit that this has a very direct bearing upon the comments of the National Radium Commission statistician, to which reference has already been made.

Clinical Investigation

It follows as an obvious corollary of the foregoing analysis that every case of carcinoma of the palate requires special investigation to eliminate the probability of its really involving the antrum. In this institute the usual procedure is to look upon every palate case with suspicion. If the lesion is entirely in the posterior part of the palate and not lateral no particular investigations are carried out beyond examination of the upper surface of the soft palate, either digitally or by inspection through a mirror. A posterior lesion involving the alveolus and the sulcus between cheek and alveolus is investigated as one in the typical antral site. The approach to lesions in the typical site is threefold.

1. *X-Ray of Sinuses.*—In the advanced case in which there is opacity of the antrum and erosion of the bone between the obvious lesion and the antrum the diagnosis is definite. The presence of an obvious lesion and opacity of the antrum but no bone erosion is suspicious enough to determine treatment. A negative *x*-ray report, however, is not of very great value unless it is confirmed by other examinations. This statement is supported by the fact that thirteen of the fifteen cases of missed antrum which were not recognized until recurrence after treatment were overlooked because negative *x*-ray reports were accepted as conclusive.

2. *The Needle Test.*—A sterile hypodermic needle whose sharpened end has been blunted is grasped in forceps and pushed into the tumour. If it passes through the bone, erosion is assumed to have taken place. In every case in which the antrum is found to be involved irradiation of the antrum as well as the palate is undertaken. The needle test is useful, but is open to criticism, and unless the palate is completely perforated it is apt to be painful. Injection of a local anaesthetic has not proved very helpful on the few occasions on which I have used it. In cases in which only the oral surface of the palate is eroded it is often possible to force the needles through the remaining bone. Probably, however, in designing treatment, lesions of this kind should be considered as already involving the antrum. When the erosion spreads outward, obliterating the alveolo-cheek sulcus, care is necessary to ensure that the needle is not merely passing upwards in soft tissues completely external to the antrum. Other than in this case a positive needle test ought to be considered to indicate the need for treatment designed to include at least the floor of the antrum in addition to the oral malignancy. Failure to get the needle through the bone has little diagnostic value, since the clinician has no sure means of knowing that he has not missed probing the one site which is perforated.

3. *Exploration of the Antrum.*—It occasionally happens that both these tests are inconclusive. In these cases either of two courses is open to the investigator: he may decide there and then that the statistical probability of antral involvement is so high that he is justified in carrying out treatment which includes the antrum, or he may ask an aural surgeon to open the antrum so that direct inspection of the lining settles the point at issue. Either of these procedures is infinitely preferable to failure to treat an involved antrum, for in thirteen of the fifteen missed antrum cases only recognized after recurrence the patients are dead, nine of them in less than a year after recognition.

It may be asked why biopsy has not been included in the description of clinical investigation. For biopsy to be of value antral lesions would need to present an entirely different histological appearance from palate ones in an overwhelming majority of cases. If they did so lesions originating in the antrum could immediately be segregated, leaving only the palate lesion perforating into the antrum to be recognized. In Table V the pathological findings in seventy-eight palate cases which did not involve the antrum are compared with those in seventy-five cases of known antral malignancy.

TABLE V.—*Proportion of Squamous Carcinoma in Palate and Antrum Tumours*

	Number Sectioned	Squamous Carcinoma	Other Tumours
Palatal malignancy not involving antrum	78	75	3
Malignancy of antrum	73	58	15

The table shows that of the seventy-eight non-antral palate growths 96 per cent. were squamous carcinomata, while of those involving the antrum 79 per cent. were of the same histology. Although there is a considerable difference in these percentages, the great preponderance of squamous carcinoma in both groups renders histological examination of little value as a differential diagnostic agent.

Improvement following Recognition of the Palate-Antrum Relationship

The relationship between lesions of the palate and the maxillary antrum was recognized in this institute two years ago, after a preliminary examination of the available statistical material. At the time it was felt that the cases were too few to justify publication of the findings. The information gained was, however, used in determining policy with regard to palate lesions.

Having demonstrated a relationship, and subsequently carried out a policy based on it, can it be shown that

improvement has been effected? I believe that it can. There has been no change in the methods of reference of patients to the Institute over the whole seven years under review, and cases referred as carcinoma of the antrum remain few. The average number of missed antrum cases per year is ten. During these seven years the Institute staff failed to recognize fifteen out of the seventy cases until recurrence took place. Of these fifteen only three have occurred during the last two years—that is, since the high incidence of antral involvement in palate malignancy was realized. Each of these three cases was missed because again a negative *x*-ray report was accepted as being conclusive.

Conclusions

It may be inferred from the report of the National Radium Commission that the frequent involvement of the maxillary antrum in certain palatal and upper alveolar malignant lesions is not generally appreciated.

Investigation in the Manchester Radium Institute of 167 cases of malignant disease of the palate showed that 94 per cent. of the lesions of the middle third of the palate, spreading on to the alveolus and into the alveololabial sulcus, involved the maxillary antrum. In the Institute this is known as the typical antral site. Lesions in the other usual palate site—that is, the posterior part of the hard palate, spreading on to the soft palate and fauces—did so in only 1.4 per cent. of the cases.

Typical antral-site lesions should be regarded as involving the antrum unless it is proved that they do not. If definite proof is not forthcoming they should be assumed to do so, and be treated accordingly. *X*-ray examination alone is conclusive only when positive. A negative report should not be accepted as being conclusive. Thirteen cases out of fifteen with antral involvement, missed until recurrence followed treatment, escaped notice through the acceptance of negative *x*-ray reports.

The needle test described is useful, but should only be accepted when positive.

Histological examination does not help to clear up the diagnosis, because of the high proportion of squamous carcinomata in both the simple palate lesions and those involving the antrum, taken in conjunction with the fact that all malignant tumours of the palate are not epitheliomata. As treatment must include both mouth and antrum, anatomical differentiation of site of origin is not considered to be of great clinical importance.

The cases seen in the Institute suggest that intra-oral ulceration is by far the commonest evidence of antral neoplasm. This finding is contrary to accepted teaching, but is not due to the fact that usually it is the more advanced cases which are referred for radiation therapy, as cheek-bulging is rare even in the obviously late cases.

It is shown that recognition of the palate–antrum relationship has been followed by a great reduction in the number of cases entirely missed until local palate treatment was followed by recurrence.

From April 1 the importation into this country of all meat, including bacon and ham, and also meat products such as canned meats, sausages, and sausage casings, will be permitted only if they are accompanied by an official certificate recognized by the Minister of Health as evidence of satisfactory inspection and hygienic preparation. The importation of certain defined classes of meat (such as scrap meat) continues to be prohibited.

TINEA OF THE FOOT

BY

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Since the discovery of pedal tinea by Whitfield in 1908 the condition has become increasingly prevalent (C. J. White, 1927a), and according to American authorities presents to-day one of the major problems of dermatological practice. The many statistical surveys that have been made in America by Hulsey and Jordan (1925), Legge, Bonar, and Templeton (1929), Andrews and Birkman (1931), and Gilman (1935), to mention only a few, appear to confirm this, and it seems strange that no comparable figures have been produced in this country. It may be as Gray (1934) said, that "the profession as a whole is still barely aware that the problem exists," and should the disease achieve the lay popularity it has achieved elsewhere there is every danger of a too free diagnosis on inadequate evidence.

Difficulties in Diagnosis

The frequent and early spontaneous disappearance of fungal mycelia from the infected area is one of the main difficulties, and in late cases there may be nothing to distinguish the condition from dermatitis from other causes (Whitfield, 1908, 1911). The reason for this disappearance is hard to understand in view of the viability of the pathogenic fungi (Farley, 1921; Weidman, 1927a; Bruhns, Alexander, and Kadisch, 1929), but the secondary bacterial contamination which sometimes occurs may in some way exert a lethal influence on the moulds. In this connexion the observations of Weidman (1926) on a case of pedal ringworm sown with yeasts are of importance. Thus it would appear that many cases of tinea, when seen, will not show the causal agent, although such authorities as J. H. Mitchell (1922) and C. J. White (1919, 1927b) countenance a diagnosis on clinical grounds alone in the chronic keratotic pedal type. This may be admissible under certain circumstances, but the demonstration of the specific factor still remains a *sine qua non* in diagnosis, and the following statement by Ramsbottom (1931) may be taken as an expression of general opinion:

> "There is, however, a tendency on the part of some investigators to assume a fungal origin of a disease on insufficient evidence. It is not enough to postulate the parasitic nature of a disease and then, bacteria, protozoa, and other parasites being eliminated, to describe it as mycotic; the evidence must be as clear as that for any other parasitic group."

In addition it must be remembered that all cases of interdigital scaling and maceration are not mycotic, although von Graffenried (1918) and Catanei (1932) have shown that such lesions form a suitable nidus. Dirt seems to bear no relation to infection, as the highest incidence is to be found among the wealthy and more leisured classes (Beintema, 1931). Therefore the practitioner will often be confronted with strong clinical evidence of fungus infection without microscopical or cultural confirmation, and a specific dermal test would be of great help in accurate diagnosis.

Previous Investigations with Mycotic Extracts

The use of mycotic extracts in the diagnosis of superficial tinea infers an altered state of reactivity in the body. That this state exists in certain bacterial diseases is a well-established fact, and for many years mycologists have endeavoured to find a corollary in ringworm infections.

The position with regard to deep ringworm has practically been cleared, but the occurrence of general changes in the superficial type has caused much controversy. The tendency towards spontaneous cure in deep tinea (Sabouraud; Greenbaum, 1924) has been explained by the development of a general immunity, and the rarity of scalp infection in adults has been cited as an example of acquired herd immunity. Supporting the development of immunity Greenbaum (1924) and Scholz (1934) showed that by inoculating guinea-pigs cutaneously with ringworm they rendered the animals immune to further inoculation, and Sabouraud found that he could not use the same animal twice in testing for the pathogenicity of moulds. Greenbaum also showed that by inoculating the skin of a human with *Trichophyton gypseum* spontaneous healing occurred in four weeks, and that the site of the lesion could not be reinfected as long as three months afterwards. Further, he claimed that the immunity thus produced was group-specific against the other ringworms, and said that "so sharply defined is this local immunity that reinoculation of a previously healed site only shows a take at the exact edge of the previous lesion." Disproving this cutaneous immunization as applied to superficial infection, Weidman (1927b) was able to infect the first interdigital cleft of his foot on two occasions with *Trichophyton cruris* after a lapse of two years, although the interval appears to have been unduly long. It is also not uncommon in tropical practice to see more than one attack of tinea cruris in the same patient, despite the fact that Gray (1934) thinks this is rather unusual.

The occasional development of distal phytid eruptions in superficial infections has been established by Jadassohn and Peck (1929), Sulzberger and Kerr (1930), Peck (1930), and Ayres and Anderson (1934), while a fungus has been recovered from the circulating blood in some cases (Sulzberger, 1928; Peck, 1930; Strickler *et al.*, 1932). It is of interest to note the inhibitory effect on ringworm cultures of serum from cases with phytid eruptions (Per and Braude, 1928; Ayres and Anderson, 1934). Ravaut and Rabeau (1932) even claim general changes in superficial yeast infections, and they have used an extract of yeast cultures, "levurin," as a diagnostic test.

From the foregoing evidence it is logical to conclude that superficial ringworm can sometimes cause local immunity, and there is reason to believe that the products of the causal fungus are not limited to the site of infection.

The diagnostic skin tests have given very variable results in the hands of different investigators. Such an eminent mycologist as Castellani (1934) places little reliance on them, although he publishes full details for the preparation of the extract; while Tarantelli (1926) and Garzella (1926) insist that to produce a positive result the lesion should be deep-seated. Amberg (1910), using linear scarification, had thirteen positives from 131 casual patients; four of the thirteen had no previous history of ringworm. Repeating this investigation, Rosen, Peck, and Sobel (1931) intradermally tested 102 dermatological patients—seventy-two of them with some pedal skin lesion—and found a positive reaction in sixty-seven. There were nine proved cases of tinea pedis in this series, and eight of them reacted strongly. Muskatblit and Director (1933) encouragingly report 72 per cent. positive results in 300 cases of superficial tinea, while Ruete and Scholz (1934) claim 100 per cent. success in proved cases. In addition, the last-named observers contend that the extract used will only react against the fungus from which it is prepared, although this is disproved by Sulzberger and Kerr (1930). These group reactions are accepted generally, and are to be expected in view of the close biological relationship of the pathogenic moulds. Lomholt (1934) and Muende (1934) regard dermal tests as being of especial value in the differentiation of mycotic from dysidrotic eczema—a matter of importance in this country on account of the insignificance of the mycotic factor in the latter type of lesion (McLachlan and Brown, 1934).

The Present Investigation

The following investigation was carried out in ships of war during the last three summers. In all, 111 cases were examined, twenty-two of them with superficial pedal tinea; the remaining eighty-nine were casual patients used as controls. In every case a careful examination of the interdigital crural and axillary folds was made, and any skin surface showing maceration or desquamation was examined microscopically for fungus, while the previous dermatological history was assessed as to the possibility of a fungus infection. Polyvalent trichophytin (Hoescht) was used throughout in a dilution of 1 in 50, and the diluent was employed as a control. Dilutions of 1 in 250 and 1 in 800 were also used at the beginning of the investigation, but were soon dispensed with as unnecessary. The solutions were renewed at monthly intervals to ensure against deterioration. After a trial of the linear scar and patch methods the intradermal route was chosen as being the most reliable. The trichophytin was injected with a fine needle into the flexor surface of the right arm and the control was injected in a similar site in the other arm, care being taken that the syringes and needles used were dry and free from traces of chemicals.

Four types of reaction were met with: (1) immediate and transient urticarial reaction; (2) inflammatory reaction; (3) inflammatory reaction with vesicle formation; (4) late eczematoid reaction. Types 1, 2, and 4 correspond to those described by Sulzberger and Wise (1932), and Type 3 has been added on account of its frequent occurrence in the strongly positive group. Type 1 was occasionally seen in the negative group, and, according to Bray, is due to tissue damage at the site of injection. The results were read at intervals of one, two, four, and seven days, and were classified according to the following table:

Classification	Day of First Appearance	Maximum Diameter of Wheal	Vesicles	Desquamation
Strong	1st-2nd	20-40 mm.	+	+ +
Medium	1st-3rd	10-20 mm.		+
Weak	2nd-3rd	10 mm.		
Negative				

The trichophytin when fresh appears to be remarkably resistant to heat, as five positive and five negative cases retested after autoclaving the extract gave the same results. A summary of the investigation is set out in tabular form below:

Type of Case	No. of Cases	Strong Reaction	Medium Reaction	Weak Reaction	Negative Reaction
(A) Microscopically proved tinea	22	14	2	2	4
(B) Control with previous history of tinea..	26	3	8	10	5
(C) Control with negative history..	63	2	15	11	35

Owing to the difference in the numbers of cases in the three groups it is proposed to scrutinize the table as it stands and not in terms of percentages. The four negatives in Group A are disappointing, but all of those cases showed "mosaic" fungi microscopically. According to Weidman (1936) such "mosaics" are either a stage in the development of fungus or are due to some fungoid action on the superficial layers of the dermis, while Whitfield (1935) regards them as artefacts due to interaction between the epidermal scales and the caustic potash used in preparation of the microscopical specimen. Repeated attempts to culture scales showing such "mosaics" were made under ideal conditions in Ramsbottom's mycological laboratory without success. Their exact nature, therefore, must be a matter for doubt, but it is of interest to note their frequent association with the accepted type of fungus. The results in Group B are gratifying, but the unavoidable personal error in assessing the history makes it difficult to draw a definite conclusion; and this becomes especially noticeable in Group C. Many patients may have had a patch of superficial tinea not diagnosed as such, or an interdigital type may have escaped notice completely. The frequency of such previous infections has been regarded as negativing the value of a positive reaction (Wise and Wolf, 1936), and this would seem to increase considerably the value of a negative reaction.

Conclusions

From this small series and from observation of the skin tests in other hands, it is permissible to state that a strong reaction in a clinically suggestive case with a negative previous history lends a bias towards a diagnosis of tinea, while a negative reaction in a similar case precludes a positive diagnosis completely.

An interesting outcome of the investigation was provided by two negative reactors in Group C. Some time after testing they developed microscopically proved tinea pedis—one with an associated tinea cruris—and when retested three weeks and twelve months after infection gave a strongly positive result.

Summary

Attention is called to the increasing frequency of pedal tinea in America and to the large number of statistical investigations published by American observers.

The lack of comparable figures in this country is noted, and appears to be due to non-appreciation of the condition among the great mass of the profession.

The difficulties and pitfalls of diagnosis are described and a conservative opinion by Ramsbottom is quoted.

The case for diagnostic dermal tests with fungus extracts is set forth and the results of some previous investigations are given.

An investigation is described and the results given in tabular form.

The limitations of a positive result are noted, and the value of a negative result in the differential diagnosis of pedal skin lesions is stressed.

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Clinical Memoranda

Pneumococcal Meningitis Treated with Prontosil Soluble

The case recorded below appears to afford further evidence of the efficacy of prontosil in the treatment of pneumococcal meningitis, and presents in addition several other points of interest.

Case Record

A girl aged 5 years was admitted to hospital on February 22, 1938, with a provisional diagnosis of meningitis. For the past three weeks she had been suffering from whooping-cough.

On examination she was found to have a generalized purpuric rash, chiefly marked on the abdomen and limbs. There was rigidity of the neck muscles and head retraction, and a tendency to opisthotonos. Photophobia was present and Kernig's sign was strongly positive. The lungs, apart from a few catarrhal signs, appeared normal, and there was an apical systolic murmur. The temperature was 101° F., the pulse rate was 160, and the respirations 30. Haematuria was present. The child was very lethargic and wore an expression of frowning discomfort.

Lumbar puncture was performed, and the cerebrospinal fluid was found to be slightly turbid and under considerable pressure. The result of pathological examination was as follows: Cells, 11,200 per c.mm. (all polynuclear); chlorides 816 mg. per c.cm.; protein, 150 mg. per c.cm.; sugar absent; globulin reaction positive. Pneumococci in direct smears and on culture.

The patient was given 10 c.cm. of prontosil soluble intramuscularly twice daily on four successive days. At the end of this period the temperature and pulse rate fell to normal, the rigidity began to diminish, and the child became less lethargic. The purpuric rash faded and the haematuria subsided.

Lumbar puncture was repeated on March 15. The cerebrospinal fluid was still under slight pressure, and examination gave the following result: Culture sterile after seventy-two hours' incubation. Cells, 100 lymphocytes per c.mm.; sugar present; chlorides, 725 mg. per c.cm.; globulin, Nonne-Apelt and Pandy reactions both negative; protein, 30 mg. per c.cm.

The patient made a complete and uneventful recovery and was discharged from hospital on March 29. Although the case presented several unusual features, there can be little doubt that the basic condition was a pneumococcal meningitis, and the response to treatment was of such a character as to justify the assumption that recovery was largely brought about by the injections of prontosil.

JOHN LANDON,
M.R.C.S., L.R.C.P., D.P.H.,
Medical Superintendent.

County Borough of East Ham
Infectious Diseases Hospital.

Mechanical Obstruction of Ileum by Appendix

The following case, which came under my care at the Victoria Hospital, Swindon, seems of sufficient interest to be placed on record.

Clinical History.—The patient, a red-haired fair-skinned boy aged 13, was admitted to hospital complaining of pain in the right iliac fossa Two years ago he had a similar attack, which subsided under conservative treatment. On January 6, 1938, about 7 a.m., pain began suddenly in the right iliac fossa, and he later felt sick and vomited. The pain was of an acute colicky nature and gradually got worse. He vomited repeatedly all day. In addition he had slight dysuria. His appetite was normally good, and he was not constipated. Apart from the common complaints of childhood, and jaundice when he was eleven years old, his previous health had been good.

On examination the abdomen was seen to move slightly with respiration. Tenderness was marked a little below McBurney's point and was associated with hyperaesthesia and slight rigidity. On rectal examination no mass could be felt, but he was extremely tender on the right side of the pelvis. Examination of the other systems revealed no abnormality.

Diagnosis.—The case was considered to be one of acute appendicitis, although it was thought to be by no means typical—inasmuch as: (1) the pain started in the right iliac fossa, (2) the patient vomited repeatedly, (3) the point of maximum tenderness was unusually low in the right iliac fossa.

Operation.—The abdomen was opened through a right gridiron incision and a distended and congested loop of small bowel was delivered through the wound. This was the terminal loop of the ileum, which was tightly and completely encircled by a large appendix, the tip of which was adherent to a tuberculous lymph node in the mesentery of the small intestine, close to the root of the appendix. The appendix itself was congested and the lymph node to which it was adherent showed softening. After freeing the appendix along its whole length appendicectomy was performed and the obstructed loop of bowel was seen to empty immediately into the caecum. A number of lymph nodes were seen in the mesentery of the ileo-caecal angle; one of these had caseated. The abdomen was closed without drainage.

Pathological examination of the appendix showed it to be congested, and no evidence of tuberculous infection was found.

I am indebted to Mr. J. Ewart Schofield, F.R.C.S., for permission to publish this case.

Millbank, S.W.1. DONALD MATHESON, M.B., Ch.B.

Reviews

GRAFTON ELLIOT SMITH

Sir Grafton Elliot Smith: A Biographical Record by his Colleagues. Edited by Warren R. Dawson, F.R.S.Ed., V.P.R.S.L., F.S.A. (Pp. 272; 5 illustrations, including a Frontispiece. 12s. 6d. net.) London: Jonathan Cape, Ltd. 1938.

Beyond any question Elliot Smith was one of the most remarkable personalities that have appeared in modern medicine. I have written "medicine," but, as may be seen from the names of the men who have contributed to his biography, his zest for knowledge carried him far beyond the wide limits of the profession to which he was bred. The editor of the biography, Mr. Warren R. Dawson, who contributes a summary of the activities with which our great anatomist crowded his life, is not a medical man; he was one of the many young men of inquiring mind who perceived the fertility of the methods which Elliot Smith began to apply to the study of Egyptian civilization at the end of the first decade of the present century, leading to conclusions which so startled and upset more orthodox scholars. Dr. W. J. Perry, who contributes a chapter on Elliot Smith as "Anthropologist and Ethnologist," is another early recruit who took up and extended lines of inquiry which arose from Elliot Smith's work in Egypt. Elliot Smith had this essential mark of the real master: he had not only the vision to see where advance of knowledge was possible but also an intuition as to the way by which that advance could be attained. Then there is another non-medical chapter by the late Lord Rutherford (a brief but invaluable chapter) describing the life which two young adventurers from the Dominions—the one from New Zealand, the other from New South Wales—led in the University of Cambridge in 1896, when Elliot Smith arrived there.

The other chapters are written—and extremely well written—by anatomists. Professor J. T. Wilson, his master—if a genius like Elliot Smith can be said to have a master—writes of early years in the University of Sydney; a chapter which leaves no doubt in the mind of the reader that, so far as Elliot Smith is concerned, the boy was father to the man. Then follows a chapter by Professor Wood Jones, who now occupies the chair of anatomy in the University of Manchester; Professor Wood Jones thus fills a position which was held and made famous by the man whom he brings so vividly to life in these pages. Professor Wood Jones joined Elliot Smith in Egypt, and deals with the most fertile phase of the master's career. Then follows the important Manchester phase, from 1909 to 1919, which is described by the pupil who succeeded him in Manchester, Professor J. S. B. Stopford, now Vice-Chancellor of the University. The account of life at University College, London, the final phase of a wonderful career, has fallen into the able hands of a former colleague at University College, Dr. H. A. Harris, now professor of anatomy in the University of Cambridge. A summary of his career as an anatomist is contributed by Dr. A. J. E. Cave of the Royal College of Surgeons of England. Thus all phases of Elliot Smith's career have been covered, and a picture has been drawn which future generations will certainly wish to possess.

Not the least valuable section is a complete bibliography; the items number 434—books, monographs, articles, and reviews being included in the list. Elliot Smith served no period of apprenticeship in his research: like all first-class men, he began his career (1894) with

a mature and finished piece of work—a research on the commissures of the mammalian brain. Being in contact with Professor J. T. Wilson, Almroth Wright, and C. J. Martin in those early years in Sydney, he acquired from them the best technique then available for microscopical work on the brain—more than students could then obtain in England. It was certainly Elliot Smith who introduced into British Anatomy modern methods of brain research. His predecessors approached the problems of the human brain by giving their attention to the form and size of its outer aspect, whereas Elliot Smith's intuition led him straight to its deepest and oldest parts—the commissures and the olfactory bulb and lobe. His predecessors began with the human brain and then worked down the animal scale; he began low down in the animal scale and worked upwards, and so came by a clear perception of the sequence of events which ended by giving man his predominant brain.

From 1894 to 1907 papers on the brain came in rapid sequence. In 1907 new items began to appear on his list of literature. He had then been teaching anatomy in the medical school at Cairo since his arrival in Egypt in 1900. Until 1907 he resolutely refused to be drawn from his prescribed course of brain research. Circumstances proved too strong for him. We find him becoming involved in the study of the ancient Egyptians—first of their bodies and then of their civilization. With most men a "new love" means a break with the "old love." But this was not so with Elliot Smith; he added subject to subject, and kept a "harem" of research going with ease.

The places held by Lord Rutherford and Sir Grafton Elliot Smith have been "filled," but their successors would be the last to claim that they had replaced them. Both advanced knowledge; both had the power to impart their gifts of mind to apt pupils; yet I feel persuaded, and the study of this life of him by old comrades and pupils has deepened my conviction, that coming generations will be interested in Elliot Smith not because of his discoveries, but because of the man he was—a man of a rich, peculiar, and lovable personality. I might have quoted passages from Stopford, Wood Jones, or H. A. Harris to bring out this personal aspect of his life, but I have refrained, leaving the enjoyment of these passages to the readers of Elliot Smith's biography.

ARTHUR KEITH.

INJURIES OF THE EAR

Traumatismes de l'Oreille. By J. A. Ramadier and R. Caussé. (Pp. 150; 15 figures. 45 fr.) Paris: Masson et Cie. 1937.

In their small volume on injuries of the ear Dr. Ramadier and Dr. Caussé group the subject-matter under four headings: (1) injuries of the external ear, tympanic membrane, and middle ear; (2) fractures of the temporal bone; (3) gunshot wounds; and (4) concussion of the labyrinth. They provide in addition a description of the examination, both clinical and pathological, required for medico-legal report or evidence.

A most important section deals with the light which has been thrown upon fractures of the skull by histological examination of the petrous portion of the temporal bone. Fractures of the temporal bone can be roughly divided into longitudinal and transverse varieties; while the oblique combines some of the characters of both, the longitudinal variety being the more common. In the longitudinal variety the line of the fracture descends from the squamous portion of the temporal bone across the tegmen tympani and middle ear and then passes along the anterior aspect of the pyramid. The tympanic membrane is ruptured, but the internal ear and the facial nerve escape injury. The transverse variety is a fracture of the labyrinth and passes across the cochlea, and often the facial nerve is injured either at the internal auditory meatus or in the aqueduct of Fallopius. The inner or labyrinthine wall of the middle ear may be injured, but the tympanic membrane remains intact.

Nager has shown histologically that in transverse fractures the capsule of the cochlea may be cracked like an eggshell from such an injury, although there is no naked-eye evidence of the fracture. If the patient recovers from a longitudinal fracture no dangerous sequel is to be feared, but after a transverse fracture the barrier between the middle ear and the internal ear is permanently impaired. Even a mild attack of otitis media is then liable to extend through the internal ear to the meninges. Thus a longitudinal fracture, which tears the tympanic membrane, is associated with some immediate risk of intracranial infection, whereas a transverse fracture with intact tympanic membrane puts the cavity of the tympanum into communication with the subarachnoid spaces at the internal auditory meatus, and heals in such a way that for the rest of his life the patient is in danger of meningitis should the middle ear become infected. The interval in recorded cases may be as short as twenty-eight days (Scheibe) or as long as fifteen (Brocq) or even sixteen (Schlittler) years, but the sequel is now proved to be a direct though remote consequence of the original injury, not a mere coincidence, and such a conclusion has been accepted by insurance companies. The information contained in the book might have been provided more concisely, but the matter is readable and is of prime importance in relation both to the management of head injuries and to the problems of compensation which arise later.

RENAL DISEASE

Practical Talks on Kidney Disease. By Edward Weiss, M.D. (Pp. 176; 3 figures, 12 tables. 9s.) London: Baillière, Tindall and Cox. 1937.

Professor Edward Weiss of Philadelphia has made a useful summary of his reading and practice in a series of practical talks on renal disease. An attack of glomerulonephritis while a resident at hospital led him to take a special interest in the subject, and his experience with himself and his patients has enabled him to produce a handy volume which is informative and stimulating. He begins by traversing the old disputes between clinicians and pathologists, and traces the development of the modern concept of renal disease. The chief function of the kidney is the removal of waste products from the blood, at the same time preventing the elimination of certain vital substances. In addition it has much to do with the regulation of the water balance and maintenance of the acid-base equilibrium of the body. Kidney disorders lead to some degree of interference with renal function, but there is no selective impairment of renal function. In chronic renal disease the kidney, by means of its reserve capacity, can compensate for a disturbance of its function with increased work. It is important to recognize that impaired renal function is a decompensation, and that failure may be brought about by extra-renal factors—diarrhoea, vomiting, active perspiration. The methods of assessing the efficiency of renal function are numerous. Not all are needed; in early cases the author recommends the modification of the concentration test suggested by Fishberg—specimens of morning urine obtained after taking no fluid after 6 p.m. the previous day; an impaired kidney cannot concentrate up to a specific

gravity of 1023. In advanced chronic renal disease the non-protein nitrogen of the blood is the best index of renal failure.

The various groups of kidney disease are discussed on orthodox lines, but the author is not afraid to state his own views. On the question of protein in the diet he insists that there is no need for restriction in glomerulonephritis except at the beginning and end of the disease; his remarks on the treatment of uraemia are practical; the nephritic oedema of the earliest stages and the nephrotic oedema of the subacute stage must be differentiated from the cardiac oedema of the final stages of chronic glomerulonephritis (small white kidney). On the subject of nephrosclerosis the author states that too much may be made of the effort to bring down the blood pressure. The patient with high blood pressure and perhaps albuminuria who is referred to as a cardiovascular-renal case may be suffering from (1) cardiac disease with renal congestion, (2) nephrosclerosis, (3) chronic glomerulonephritis, or (4) a combination of these processes. Progress in this subject is impeded by a failure to differentiate them. A series of plates beautifully illustrates the eye-grounds and vascular changes in this group of diseases. Unfortunately numerous misprints, sometimes the omission of a word, make reading difficult and indicate hasty proof-reading. These detract from the pleasure of handling a well-informed book on renal disease.

THE STEROL GROUP

Sterols and Related Compounds. A Series of Three Lectures delivered at the Institute of Biochemistry, Cambridge. By Professor E. Friedmann, M.D., Ph.D. With a Foreword by Sir Frederick Gowland Hopkins, O.M., F.R.S. (Pp. 100. 7s. 6d. net.) Cambridge: W. Heffer and Sons. 1937.

These lectures were delivered by Professor Friedmann in 1936. Sir F. Gowland Hopkins, in a foreword, points out the rapid development of the importance of the sterol compounds for both chemistry and biology. As always happens in such cases the mass of resultant literature is such as to make it inaccessible to all but specialists, and hence an authoritative review on the subject is of great general value. The sterol group includes substances with an extraordinary variety of important physiological and pharmacological actions. This variety is fully indicated by the chapter headings, which read: sterols, bile acids, heart poisons, saponins, vitamin D, sex hormones, and carcinogenic agents. Even this list does not exhaust the activities of sterol derivatives since the same group also includes the adrenal cortex hormone, vitamin E, and the organizers which regulate development in embryonic tissues.

The author treats the subject from the chemical aspect and gives a brief but lucid account of the brilliant researches whereby the relationships between these different groups have been established. The order of the complexity of the subject is indicated by the fact that irradiation of ergosterol produces at least six different derivatives, only one of which (calciferol or vitamin D_2) is antirachitic, while antirachitic principle of fish-liver oils (vitamin D_3) is yet another related compound. Similarly the author describes seven different forms under the general term "follicular hormone." Facts such as these indicate the intricacy of the problems with which he deals. The chemistry of this group is of exceptional importance from many points of view, and it is particularly important to medical science because advance in this field is the only hope of obtaining a number of important hormones and vitamins in quantities adequate for general clinical use.

The volume is short (100 pages) but is liberally illustrated with structural formulae. The reason for its brevity is indicated by Sir F. Gowland Hopkins: "The author has the gift of conveying clear and adequate information in the fewest possible words. The book contains, I believe, no single redundant sentence nor one unnecessary word."

LEGAL MEDICINE IN AMERICA

Legal Medicine and Toxicology. By Thomas A. Gonzales, M.D., Morgan Vance, M.D., and Milton Helpern, M.D. (Pp. 754; 244 figures. 42s.) New York and London: D. Appleton-Century Company. 1937.

Medical jurisprudence, in the sense of the science of criminal necrology, is practical or nothing. It grows in the unsavoury soil of the mortuary and flourishes in large and turbulent cities. These authors have for years been investigating violent, sudden, and suspicious deaths in the police department of New York. Few better opportunities could be imagined for acquiring a familiarity with the victims of suicide, murder, and accident. In the city of New York the medical examiner's office investigates about 15,000 deaths every year. Since 1918, when the coroner was abolished, it has investigated over a quarter of a million deaths. The authors are pupils and close associates of the late Dr. Charles Norris, the first chief medical examiner of the city, and form one of the most famous teaching organizations for legal medicine in the world. They are therefore excellently qualified to write a classical textbook, and they have written one which may well be adopted in all English-speaking countries as a guide to the solution of medico-legal problems of every kind. Its bias is naturally upon criminology, but no part of the science is neglected.

Toxicology is treated in a separate section and from a practical point of view. The various poisons are dealt with in separate chapters under their main headings—for example, poisonous gases, corrosives, metals, and salts; and their analyses are treated in detail in three more chapters. The authors discuss in close detail the routine work of the medico-legal expert, and the section on blood-grouping is full and up to date. The rights and obligations of physicians are taken rather shortly, but adequate attention is given to the medical side of insurance and compensation. There is probably more to be said about forensic psychiatry than the authors say in six pages, but into those six pages they have compressed much valuable information. Briefly, the book has no gaps and hardly a word is superfluous. It is beautifully classified, and the detailed table of contents almost makes the index superfluous. Its most striking feature is its enormous number of excellent photographs, mostly of corpses in various stages of decomposition or mutilation. One drawback is the immense weight of the volume, perhaps due to the demand of the half-tone blocks for a heavily loaded paper.

Notes on Books

In his small book *Failure of the Heart and Circulation*, which is one of a series termed Pocket-Monographs on Practical Medicine, Dr. TERENCE EAST has, by the use of an epigrammatic style and the complete exclusion of padding, succeeded in comprising more real information than is contained in some large textbooks. The modern views on the mechanism, types, and causes of heart failure are given, not in any detail but so that the student may understand the principles, and symptoms are likewise dis-

cussed in the light of recent work on pathological physiology. The relatively long section on treatment is an admirable summary of essentials, though it is difficult to understand the author's luke-warm approval of digitalis for failure with normal rhythm. There are occasional other points on which cardiologists might differ, but as a whole the book gives the student and practitioner a sound outline of cardiology presented in the best way—that is, on the basis of physiology In spite of the terse style it is clear and readable. The publishers are J. Bale, Sons and Curnow, and the price is half-a-crown.

The Baths of Bath in the Sixteenth and Early Seventeenth Centuries is a little book by P. ROWLAND JAMES, M.A. (J. W. Arrowsmith, 5s.). Visitors to Bath are so accustomed to think of the city as a beautiful town peopled by the brilliant company known to Jane Austen that Mr. Rowland James has done good service by describing its rise. It was a small-walled city in the reign of Henry VIII inhabited by cloth-workers, the baths were negligible, and spa treatment had not yet come into vogue. A hundred years later William Turner, Doctor of Medicine, Dean of Wells, and a great botanist, Dr. Jorden, and Toby Venner had drawn attention to the baths. Anne of Denmark, Queen of James I, Charles I, and Henrietta Maria visited them, their reputation was made, and the cloth-workers became keepers of lodging-houses. Mr. Rowland James tells the story of the change, going to original documents for his facts and illustrating them with maps and copies of old engravings. Appendices contain a list of distinguished visitors to Bath from 1573 to 1624; among them are Queen Elizabeth, the Earl of Essex, Sir Walter Raleigh, Thomas Howard Earl of Arundel, and many others. There is a record of the companies of players who were present in Bath between 1569 and 1617, and a hand-list of the manuscripts and principal works consulted.

Dr. E. P. STIBBE'S *Introduction to Physical Anthropology* (Edward Arnold, 10s. 6d.) has satisfied an urgent demand for a short book giving the necessary information for "field workers" in anthropology, and the new edition of his manual, which has been fully revised and enlarged, will be very welcome. The general trend of the first edition has been maintained—namely, a clear account of the aims and scope of physical anthropology combined with detailed information of just those points which it is necessary for a non-professional worker to know. The new edition includes an excellent elementary account of modern statistical methods by Dr. W. A. M. Smart, some new illustrations, and a considerable amount of recent information on anthropological discoveries, such as the newly found skulls of *Sinanthropus*.

A new paper (No. VII) by John R. Baker, M.A., D.Phil., lecturer in cytology in the University of Oxford, on *The Spermicidal Powers of Chemical Contraceptives: Approved Tests*, is now available from the office of the National Birth Control Association, 69, Eccleston Square, London, S.W.1, price 6d., post free 7½d.

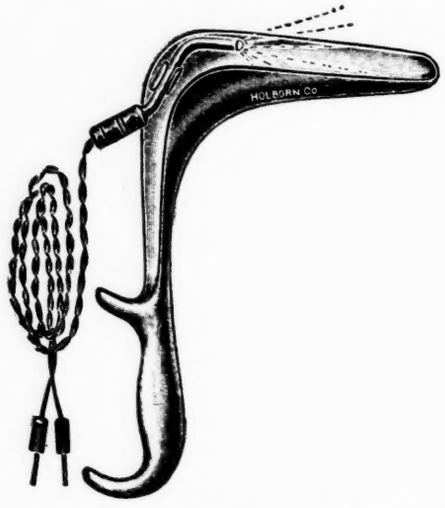
Dr. WALTER RUHMANN of Berlin issues a translation into German of the *Liber de Rheumatismo et pleuritide dorsali* which appears appropriately enough at a time when rheumatism is attracting general attention. The original treatise was published in Paris in 1542 by Ballonius (1538-1616), one of the great teachers of the French school of medicine. Ballonius, known to his contemporaries as Guillaume de Baillou, was urgent that medicine should go back to Hippocratic methods and was thus in some sort a forerunner of Sydenham in our own country. Dr. Ruhmann, in addition to the translation, supplies an introduction, an appendix, and a list of the works consulted. He also reproduces a pleasing engraving of Ballonius at the age of 43. The book is published at Mittenwald by Arthur Nemayer, price RM. 1.80 or RM. 3 bound. It is entitled *Das Rheumabuch des Doktor Ballonius*.

Preparations and Appliances

INDUCTION SPECULUM

Mr. A. LEECH-WILKINSON and Dr. D. A. MITCHELL (Bath) write:

This instrument has been devised for the special purpose of induction of labour by the Drew Smythe catheter method, or by simple puncture of the membranes without anaesthesia. It has been found particularly useful in multiparae, in whom the voluminous folds of the vagina are apt to bury the ordinary Sims speculum and prevent vision of the cervix, which may be situated high up behind the foetal head. The distal (cervical) end of the instrument is exactly



the same width as the ordinary Sims speculum but shallower; from this point backwards it broadens generously to its proximal extremity, the sides being deepened and the length increased. A retractor type of handle is employed as giving the best command of the blade, and, with the patient in the left lateral position, the clip of the light-carrier lies on the inner aspect of the upper side.

The instrument has been made for us by the Holborn Surgical Instrument Company, Ltd., 26, Thavies Inn, London, E.C.1.

HOMOGENIZED INFANTS' FOODS

Libby's homogenized baby foods (Libby, McNeill and Libby, Ltd.) represent an interesting advance in infant feeding. Vegetables, fruits, and cereals are treated by a special method which breaks down the cells and subdivides fibres into fine particles. The material is thus reduced to a fine powder, which can be digested in the absence of the enzymes necessary to break down vegetable cells.

The manufacturers provide pamphlets which report on an extensive series of laboratory and clinical experiments. Vitamin assays showed a high vitamin content. *In vitro* tests with digestive enzymes showed a rapid conversion of starch to lower carbohydrates. *X*-ray examination showed that homogenized vegetables left the stomach about four times as quickly as did strained vegetables. A dietary study on seventy infants showed that homogenized vegetables did not cause gastro-intestinal disturbance and prevented the development of nutritional anaemia.

The makers claim that these homogenized preparations make it possible to supply infants with vegetables at the age of three months. The introduction of these preparations would appear to constitute an important advance in infant feeding, and the manufacturers are to be congratulated on the care with which they have organized exhaustive tests of the properties of their products.

ANTE-NATAL CARE AND SOME COMPLICATIONS OF LABOUR

BY

D. J. MacRAE, M.B., F.R.C.S.Ed., M.C.O.G.

Obstetric Registrar, St. Mary's Hospital

It is commonly understood that the first stage of labour begins with the establishment of uterine contractions. It would, however, be of greater benefit if it were considered that this stage began during the last few weeks of pregnancy, with the formation of the lower uterine segment and a slow moulding and reconnoitring of the presenting part into the most acceptable pelvic position. At this time there arise also in the patient's mind those vague doubts and fears which, if not allayed, may influence injuriously the course of labour. It is during these latter weeks, too, that many fundamental decisions are made and skilled guidance given which will have a profound effect on the ultimate labour.

Pelvic Measurements

It is well to obtain a mental picture of the physical and sexual development of the patient before beginning the examination of the pelvis. A short, squat figure and absence of femininity often reflects a similar lack of female characteristics in the bony pelvis and may be associated with indifferent pains at parturition. Knowledge of the external pelvic measurements alone is of little value, and the teaching that the foetal head is the best pelvimeter is but partially true. There are cases with normal external measurements in which internal examination may reveal a jutting sacral promontory or undue prominence of the ischial spines. Again, cases are seen in which the foetal head cannot be made to engage in the pelvis although an easy labour may ensue, or in which the head may engage but labour be prolonged and even difficult. If a foetal head passes through the pelvic inlet it should likewise, in the great majority of cases, pass through the outlet. Yet experience shows that many such cases are liable to end in stillbirth. Minor degrees of pelvic contraction, while permitting delivery, may so delay descent, or initiate uterine inertia, that there is a prolonged and dangerous compression of the foetal head. It is only by means of a careful examination of the pelvic cavity and outlet that such difficulties can be foreseen. Routine internal examination educates the fingers to the normal pelvic roominess and permits estimation of the available space in the anterior and posterior segments of the pelvic straits, so that when any abnormality is encountered it is readily appreciated.

Gauging the width of the subpubic angle is difficult and requires practice, but the posterior segment can readily be measured. The method of Caldwell and Molloy is preferable to that of the estimation of the posterior sagittal diameter. In the former the distance between the sacrum and the ischial spine is measured along the sacro-spinous ligament, and in the normal female pelvis this should accommodate three fingers. With a normally curved sacrum a shorter measurement here suggests a small sacro-sciatic notch conforming with that found in the male type of pelvis, in which delay of the head at the outlet is liable to occur. When, as often happens with this kind of pelvis, the head has engaged in a posterior position, the narrowing outlet may lead to a failure in rotation and result in the typical deep transverse arrest of the foetal head. The smallness of the subpubic angle also leads to outlet delay; the occiput finds difficulty in slipping below the pubic arch, and if the perineum is firm an episiotomy or the application of forceps to the low-lying head will be necessary.

Position of the Foetal Head

A careful palpation is made of the abdomen to reveal the position of the foetal head. In the majority of cases it will be found lying in the transverse diameter of the pelvic inlet with the occiput to one or other side, and in patients with a normal pelvis and development no difficulty is to be expected at parturition. A posterior position of the occiput, on the other hand, is sometimes associated with an abnormal pelvis, and especially one with male tendencies. At one time Buist pads were used to induce an anterior rotation of the occiput, and Herman practised an external rotation of the head and body. Such methods, however, are neither sufficiently successful nor are they always indicated; in certain types of pelves it is normal for the head to descend in a posterior position. If immediate correction is undertaken it is usually found at the next ante-natal examination that the foetal head has reverted to its previous position. The majority of cases ending as they do successfully for mother and child, are hence at this stage best left alone. When in the absence of pelvic abnormalities or tumours the foetal head is found, in the latter weeks of pregnancy, in an abnormal position—in the fundus or iliac fossa—and, being corrected, persists in moving away from the lower pole of the uterus, a low insertion of the placenta may be suspected. Such patients may well be treated on the lines of those suffering from ante-partum haemorrhage and be admitted to hospital for the appropriate investigations.

The Non-engaged Head

There is no manœuvre better suited for demonstrating whether a non-engaged head will or will not enter the pelvis than that used by Fahmy. With the index finger and the thumb exerting pressure upon the occiput and sinciput respectively the patient is asked to sit upon the examination couch. On doing so unaided her abdominal muscles tighten, often pressing the foetal head into the pelvis. If, however, the head does not descend with digital pressure, as may happen in the patient with an increased pelvic inclination, an additional manœuvre can be attempted. The patient is made to lean as far forward as possible, relaxing the abdominal muscles and thereby enabling the uterus to fall more into line with this less vertical axis of the pelvic inlet. Then digital pressure often causes the head to enter the pelvis with an ease and spontaneity which is at once surprising and comforting; any overlapping of the foetal head on the symphysis pubis is readily appreciated at this time by the palm of the examining hand, which can feel simultaneously the foetal head and the pubes.

Some of the cases of non-engagement of the foetal head left to have a trial labour belong to the class with increased pelvic inclination. The quick descent of the head which is so often seen after rupture of the membranes in these cases can be understood. The head resting uneasily upon the pelvic brim when labour starts allows the liquor amnii freely to escape below it with each contraction; there is therefore in the early stages of labour a failure of descent of the foetal head. The bag of waters meanwhile allows of a slow taking up of the cervix, but as soon as the external os begins to dilate there is the risk of rupture of the membrane. With the membranes ruptured the uterus is able to push directly on the foetus, usually causing the head to enter the pelvis in the position of anterior asynclitism. Good contractions and the direct pressure of the foetal head allow the thin lower uterine segment and the os to be pulled up and dilated.

The Patient's Mental Attitude

There is no physiological process in which the mental attitude of the patient exerts a more profound influence than during pregnancy and labour. Its effects in inducing pathological conditions and serious mental disturbances are well known, and it is equally important to recognize the physical effect this mental attitude can produce in relation to the actual birth of the child. There is no greater error than to omit to treat, especially in primigravidae, incipient fears and misgivings. Furthermore, a

system whereby ante-natal care and parturition are considered as two different processes, or where there is separate control over these two periods, is greatly to the disadvantage of the accoucheur and the patient. The mental influence on the course of labour may be considered in relation to (*a*) the prolongation of labour and (*b*) abnormal labour.

The relative increase in the number of primigravidae has brought into prominence the nervous type of patient, who is restless and apprehensive, and with whom a long first stage of labour is common. With an increase, too, of later child-bearing, the elderly and nervous primigravida is more often encountered. Of a series of 350 primigravidae with normal pelves recently investigated, following a full-term pregnancy, it was found that 295 were below 30 years of age, and with them the first stage of labour had an average length of 14.75 hours; for the fifty-five primigravidae over 30 years of age the average length of this stage of labour was 20.5 hours—a finding which must have some bearing on a foetal and neo-natal mortality of 5.8 per cent. in the former group and 9.1 per cent. in the latter. The nervous primigravida is easily recognized at the ante-natal clinic, and special care should be taken to reassure her concerning the outcome of labour; while to the elderly patient it may well be explained that labour, if slightly longer, will still be taking a normal and expected course. Slow dilatation of the os uteri in these cases may best be treated by allaying the patient's fears, and the administration of morphine and scopolamine or large doses of bromide and chloral hydrate.

There are cases in which the first stage of labour proceeds along its slow way for several days. This delay is a serious complication and one which is liable to end with foetal death and maternal morbidity. Two distinct and clearly differentiated groups of cases may be recognized: (1) those in which uterine inertia is present; and (2) those in which there is spasm or non-relaxation of the external os.

Uterine Inertia

Uterine inertia is a condition so full of potential dangers that, to avoid it, many obstetricians give quinine bihydrochloride, 2 grains three times a day, to all primigravidae during the last two weeks of pregnancy. Attempts to justify, by controlled observation, the use of this substance have been made, and although there is as yet no final proof, most clinicians are convinced of its value. In the type of case found at the ante-natal clinic to be excitable and introspective a course of this treatment may well be advised. During the progress of labour the patient should be kept quietly in a separate cubicle or first-stage room, where she will be saved the worry of watching other women more fortunate in labour. The general strength should meanwhile be maintained, and provided that the membranes are intact the prognosis remains good. The spontaneous return of uterine contractions is hoped for, and heralds as a rule a satisfactory progress to delivery. The use of pituitary extract in small doses (2 units half-hourly for four doses) may initiate uterine contractions, but should be given only if the close attendance of the accoucheur is possible.

In the uncommon cases in which there is non-relaxation of the external os the uterus is active, often excessively so, and slight, frequently recurring pains, to which the patient is specially sensitive, are present; the foetal head is usually low in the pelvic cavity. The true condition, however, is revealed by vaginal examination; the cervix is found completely taken up, but with the external os only one or two fingers dilated and stretched, parchment-like, over the foetal head. The cervix under these conditions either completely resists or tears with manual dilatation. The usual treatment is to give morphine. Stimulants such as pituitary extract have no effect in producing the cervical relaxation, and their use may be dangerous. There is still, unfortunately, the occasional recalcitrant case in which morphine is given too late or fails to act, so that the condition may persist for several days. The method usually employed for such a case is to make incisions in the cervix, as described by Duhrssen. The alternative and perhaps easier method of treatment, however, is to give a spinal anaesthetic and then manually dilate the cervical os, according to the method of Delmas, and proceed to deliver the child with forceps. The readiness and the ease with which the resistant os becomes relaxed under spinal anaesthesia is striking. Delmas successfully uses spinal anaesthesia to dilate the cervix manually under many conditions, but similar attempts in this country, some years ago, did not meet with equal success. The method was then used as an accouchement forcé in cases in which the cervix was thick and not canalized, but usually ended in failure. It may be that had attempts been confined to the type of case described above the results would have been more gratifying. One effect of the spinal anaesthetic is to cut off sympathetic stimulation to the uterus or break reflex control. The ease with which the cervix yields to manual dilatation suggests that the condition is primarily of nervous origin and is similar to achalasia elsewhere in the body.

Summary

The first stage of labour and its treatment do not start in the labour room but in the ante-natal clinic.

Undivided control over the latter weeks of pregnancy and the succeeding labour would serve greatly to lessen their complications.

The foetal head can be used as a pelvimeter only in relation to the pelvic inlet. A manœuvre used in cases of increased pelvic inclination is described.

In the treatment of many of the complications of the first stage of labour the priority of prophylaxis is to be emphasized. The practice of meeting pre-natally the sociological problems of the patient is one which should commend itself to the obstetrician.

The condition described as achalasia of the cervix is a serious if rare complication of labour and demands a separate line of treatment.

ALCOHOL, TOBACCO, AND PHYSICAL EFFICIENCY

LECTURE BY DR. ABRAHAMS

Dr. Adolphe Abrahams, dean of the Westminster Hospital Medical School, opened a discussion at the Society for the Study of Inebriety on April 12, on "The Influence of Alcohol, Tobacco, and Physical Efficiency." The following is an abstract of his paper:

Restriction of Alcohol

To the athlete, the problem of alcohol very rarely makes an appeal from a purely moral or sociological aspect. In slavish imitation of the training methods of a famous performer, he may yield to the imbibition of draughts distasteful, perhaps even nauseating. Alternatively, the recognition of total abstinence as a conspicuous feature in a champion may inspire an attitude which regards a drop of any alcoholic beverage as virulent poison.

Restriction of drinking in the training of old-time pugilists and pedestrians was probably the most salutary law that could be framed and enforced; and when athletics became fashionable, the young bloods of the period naturally imitated the methods of the professional, more especially since in those days comparison in regard to intemperance and other evil-living would hardly have been flattering to the amateur. But nowadays the chronic alcoholic does not contemplate a course of orthodox training, or, if he attempts the venture, speedily abandons it, and the modern athlete demands a ruling on the purely

scientific side. He asks if alcohol is a special indication in the production of the highest form of physical efficiency, or he will accept an assurance that by its use efficiency may be reduced. We are entitled to inform him that there is no evidence that alcohol is a good food for muscular work and that Starling's experiments showed a depressant action upon the mammalian heart, dilatation of the ventricles occurring if the percentage in the blood reached 0.06. Attwater and Benedict's laboratory observations upon the efficiency of the body as a machine—29.55 per cent. without alcohol and 25.62 per cent. with alcohol—have been confirmed by investigations during mountain climbing.

Tobacco and Training

The difficulty of assessing the influence of tobacco-smoking upon athletic capability is the unsatisfactory character of control experiments. Up to thirty years ago the non-smoking athletic young man was a *rara avis*, and any contests that might have been arranged between smokers and non-smokers would have been overwhelmingly in favour of the former. For some time, however, there has been an increasing tendency among young men to abstain, possibly as a reaction against feminine participation; and yet, although more material is available, control experiments are still far from convincing.

It is traditionally claimed that smoking is "bad for the wind," but "the wind" is by no means a concrete entity: it is merely a convenient synonym for capacity for exertion, which is a complicated problem into which a large number of factors enter. To assert that smoking is "bad for the wind" we must postulate direct poisoning of the heart muscle or its nervous mechanism, or of the respiratory system, or impairment of the oxygen-carrying capacity of the blood.

Athletes are rarely heavy smokers, though, as is well known, susceptibility to the toxic action of tobacco is very variable. It is probable that there is a reduction in efficiency difficult to measure and comparatively trivial; but in modern high-grade competition even a tiny reduction is of consequence. Against this may be off-set the sedative effect which may be of value to the highly strung emotional type not infrequently encountered in the athletic world. It is significant that while some of the greatest track athletes smoke throughout their training, and even to the very last moment preceding their contest, long-distance cyclists are almost invariably non-smokers. They do not abstain from a conviction that it is "bad for the wind" but because they are not interested. The long-distance cyclist has a relatively stolid mentality and temperament, and has no urge towards stimulants, anodynes, or narcotics.

"Doping" for Athletic Contests

There will always be a disposition to believe in the existence of some drug, "nerve tonic," or "strengthening medicine" capable of directly producing or increasing physical efficiency, and several preparations have been employed and have secured an entirely undeserved reputation. Suggestion plays the greatest part in any benefit that may in the majority of cases be claimed, but another and more serious aspect of the matter deserves attention. It is possible that a drug which cuts out inhibitions might enable the system to draw upon its reserves of energy in moments of stress. It is doubtless with such a drug in their minds that authorities on the Continent have thought it necessary to "warn their athletes against the dangerous practice of doping." The International Olympic Council at its recent meeting condemned the use of all such preparations, but only in general terms. So far as this country is concerned, the practice of "doping" must be entirely non-existent, whatever obtains elsewhere; and the sporting spirit of the nation would revolt against any systematic application of anything of the kind save on special occasions in the interest of strict scientific investigation.

Nova et Vetera

IVAR VICTOR SANDSTRÖM AND THE PARATHYROIDS

Though probably seen by Remak in 1855, Sir Richard Owen in 1862, and Virchow in 1863, the first complete account of the parathyroids was given in 1880 by Ivar Sandström (1852-89) of Stockholm, who had originally discovered the "new gland" by naked-eye dissection in a dog in 1877; he was then a medical student, thus resembling Sir James Paget in his discovery of the *Trichina spiralis* on February 2, 1835, when a first-year student at St. Bartholomew's Hospital. Sandström's full description of "A New Gland in Man and Several Animals" in 1880 was published in Swedish, and was briefly abstracted in Schmidt's *Jahrb. d. ges. Med.*, and in the *Jahresber. u. d. Fortschr. d. Anat. u. Physiol.* in the same year.

An English Translation

Probably inspired by Professor John Fulton of Yale a translation—apparently the first into any language—has been made and is now published,[1] with the reproduction of the original illustrations, by Dr. Carl M. Seipel of Stockholm, who has spent two years at Yale. This translation is accompanied by an introduction from Miss Charlotte M. Peters and Professor Fulton, by two notes, historical (1908) and biographical (1936), by the well-known Dr. Johan August Hammar, professor emeritus of anatomy at the University of Uppsala, and by a letter from Sandström to his sister in 1880 describing with ironic humour a scientific meeting where "everyone seemed to be there with the intention of showing what discoveries *he* had made, and at the same time give the astonished world the opportunity to have a look at the fortunate discoverer."

Sandström's original paper of thirty-one pages showed that the glandulae parathyreodeae, the name he suggested in the text to express the characteristic of "bye-glands to the thyroid," were found, though in varying numbers, in all the human bodies—about fifty—which he examined, and also in the horse, ox, dog, cat, and rabbit. A translation into German was submitted about the same time for publication in a German Archiv, but was returned with the message that it must be considerably shortened before publication. It attracted little or no attention until the parathyroids were rediscovered by Eugène Gley of Paris in 1891. Sandström regarded the parathyroids as embryonic organs related to the thyroid but arrested at different stages of development, more or less far from the type of the mature thyroid. He also described cysts, usually small and multiple, in the glands and also amyloid change.

Coming of a distinguished family in Stockholm, his brother being a prominent Latin scholar and a sister a pioneer in school teaching, Sandström was a talented and original researcher with a fine presence. Hammar described him as a born teacher who started a method of lecturing on histology with miscroscopical slides available for each student in the audience. Unfortunately he inherited mental disorder from his mother, and this brought a promising career to a close by suicide in 1889.

HUMPHRY ROLLESTON.

One hundred years ago John Elliotson (1791–1868) had to resign his professorship of the practice of medicine at University College and his physicianship to the hospital because of his interest in mesmerism. Shortly afterwards he founded the London Mesmeric Infirmary in Weymouth Street.

[1] *Bull. Instit. History of Med., Johns Hopkins Univ.*, Baltimore, 1938, **6**, 179.

ONE HUNDRED AND SIXTH ANNUAL MEETING
OF THE

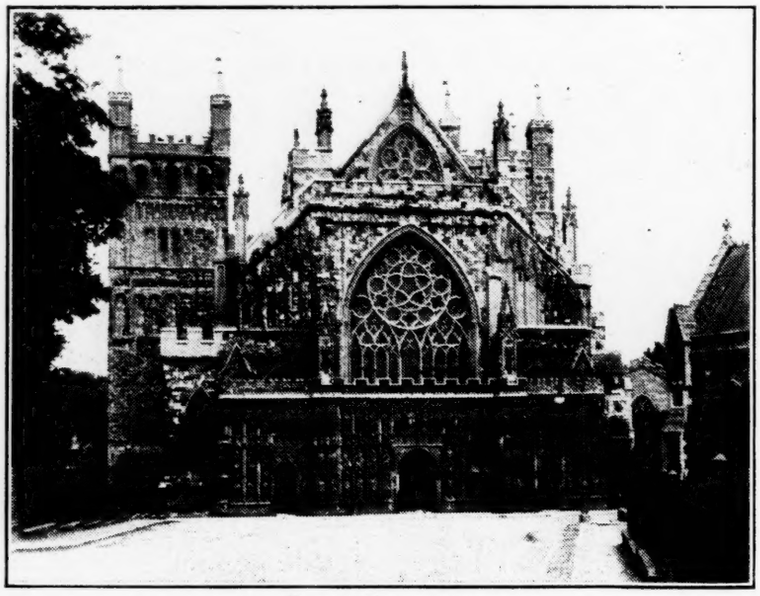
BRITISH MEDICAL ASSOCIATION
PLYMOUTH, 1938

THE one hundred and sixth Annual Meeting of the British Medical Association will be held in Plymouth next summer under the presidency of Dr. Colin D. Lindsay, senior physician to the Prince of Wales's Hospital, Plymouth: he will deliver his address to the Association on the evening of Tuesday, July 19. The Sectional Meetings for scientific and clinical work will be held on Wednesday, Thursday, and Friday, July 20, 21, and 22, the morning sessions being given up to discussions and the reading of papers. The Annual Representative Meeting for the transaction of medico-political business will begin on the previous Friday, July 15. The full list of presidents, vice-presidents, and honorary secretaries of the seventeen Scientific Sections, the provisional programme and time-table, information about accommodation, and other details of the arrangements for the Annual Meeting were published in the *Supplement* of April 9. We publish below the third of a series of descriptive and historical articles on Plymouth. The first and second articles appeared on January 1 (p. 32) and March 5 (p. 518).

DEVON AND CORNWALL

Few counties can compare with Devon and Cornwall for richness of scenery, the chief characteristic of which is probably its vivid contrasts. Compare that vast tableland of Dartmoor with its rugged tors, its wide expanses of sparse moorland, its tumbling streams, and its panoramic views, with the winding lanes in the softer lowlands leading to the coast, flanked by high hedges in brilliant greens of grass and fern, and gemmed with a rich variety of wild flowers, which thrive in profusion. Again, compare the romantic cliffs of North Cornwall, those huge natural battlements presenting passive yet impregnable resistance to the never-ceasing onslaught of Atlantic rollers, with the quiet retreat of Dartmeet, where two rivulets born among the crags of the moor join forces on their journey to the sea, "making sweet music with th' enamel'd stones."

Beauties are here for visitors to enjoy, and excursions have been arranged to enable them to appreciate all that the two counties have to offer. Any who are interested in history or in archaeology as well as natural beauty will find much to appeal to their tastes, as the West is rich in both. This may be judged from some of the salient features of places to be visited.



EXETER CATHEDRAL

(Henry Wykes, Exeter: by courtesy of Corporation of City of Exeter)

Exeter

Exeter is the county town, Parliamentary and municipal borough, seat of a bishopric, head of an archdeaconry, a city and shire with its own sheriff and under-sheriff, and a county borough. Its situation is both picturesque and commanding, and it is a notable fact that from prehistoric times it has maintained unbroken its position as the local capital. Long before the Roman invasion it was the most ancient of British cities, and though the Roman dominion ceased early in the fifth century, it became the head of Damnonia and the chief city of the West. When its recorded history began towards the close of the ninth century it was the leading city of the West Saxon kingdom. The origin of its municipal constitution is not on record, although it was presumably governed by reeves. Its first charter was granted by Henry II, and it elected parliamentary representatives as far back as 1264.

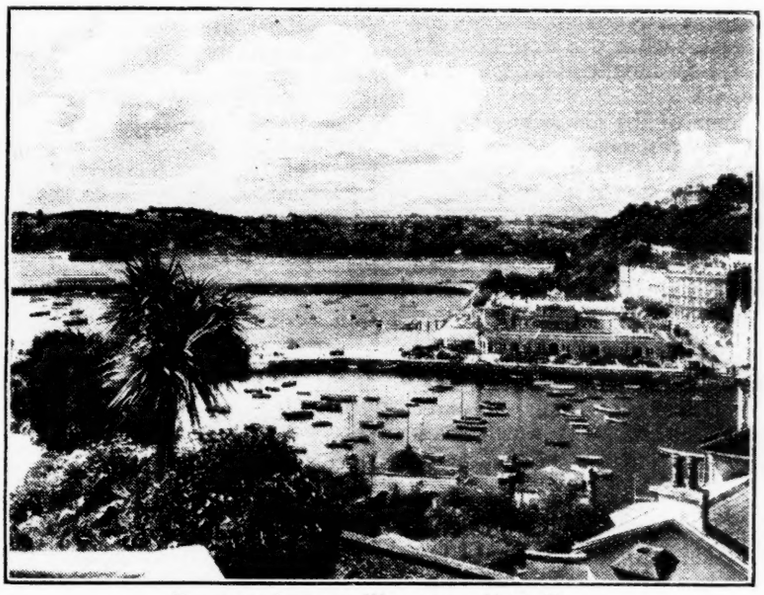
Exeter preserves much of the past and yet is up to date, possessing fine modern buildings and old historic houses. A magnificent and venerable pile is the Cathedral, with its bold and massive design, rich in the decorated tracery of its windows. Of its original erection nothing is known. A local historian of the sixteenth century said there were within the precincts of the close three religious houses, a nunnery—now the Dean's house—and two monasteries, one founded in 868 and the other in 932. The Chapter House dates back to 1224 and the Cathedral register to 1594, but the episcopal register contains entries from 1258. The peal of bells is stated to be the heaviest in England. One large bell, known as Great Peter and weighing over six tons, was presented to Bishop Peter Courtenay in 1480. The Guildhall, another notable building, was built in 1330 and re-erected in 1464. Rougemont Castle, at one time a fortress, stands on a rocky eminence on the north angle of the city wall, two hundred feet above sea level. The corporation possesses many treasures: there is a fine museum as well as the up-to-date buildings of the University College of the South-West.

Torquay

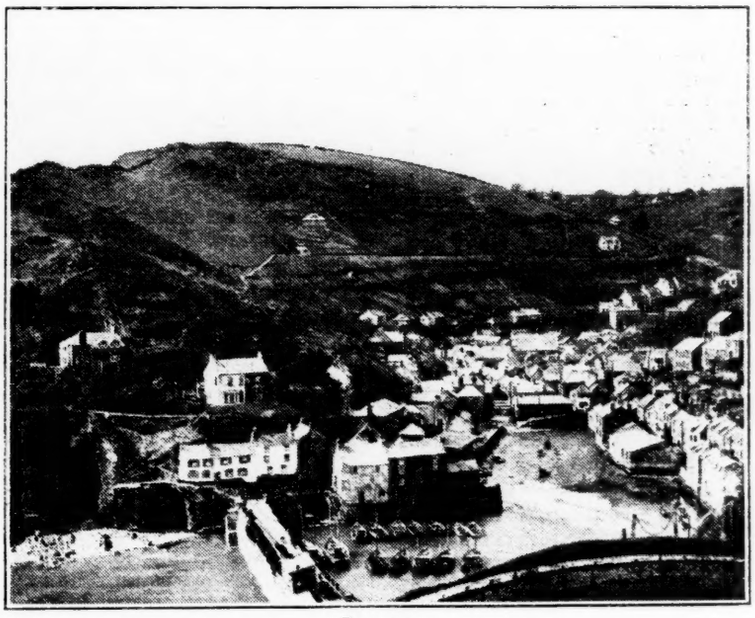
From whatever point of vantage one looks down on Torbay, Torquay is always a beautiful sight. To-day the space called Torbay is covered with water, and this has been its condition for thousands of years: but such has not always been the case. At least twice previously luxuriant forests have flourished here where now the tides

ebb and flow. Geologists can point out the raised beaches indicating its former possession by the sea, and any day at low water relics of the more recent forest may be seen on the Torre Abbey sands.

In 1588 one of the captured galleons (the *Capitana*) of the so-called invincible Armada was brought into Torbay, and her soldiers and sailors placed as prisoners in the tithe barn of Torre Abbey. Their memory still haunts the place, for it has been called "The Spanish Barn" ever since. In 1688 the Prince of Orange, afterwards William III, came here and landed at Brixham, whence he marched to Exeter on his way to London. The Jacobite Duke of Ormonde sailed into the bay in 1715 with the object of raising Devonshire on behalf of the Pretender, but as no response was made to his signals he sailed back to France. During the wars preceding and accompanying the French Revolution Torbay was the place of assembly for a long succession of fleets. Maritime war preparations were constantly present until the arrival of Napoleon on board the *Bellerophon* in 1815, after which, beyond the occasional appearance of a few warships, peace descended on these waters.



TORQUAY: LOOKING WEST FROM VANE HILL
(Reproduced by courtesy of the G.W.R. Company)



POLPERRO
(Western Morning News Co., Ltd., Plymouth)

It was during these French wars that Torquay began to grow. A ship would be ordered to Torbay to await the arrival of her consorts and might be lying there for months before the requisite complement to form the fleet was assembled; and nearly all our celebrated admirals, including Nelson, St. Vincent, and Howe, came here, hoisted their flags, and sailed away. The coming of these strangers encouraged the natives to build a few small houses to accommodate them and their families. Very few of these families lacked an ailing member, and it was soon apparent that many of these benefited by their stay in Devon; so the beginning of Torquay's climatic reputation may really be ascribed to the French wars.

Every visitor must be struck by the beauty of Torquay. The town is built on a series of hills, on which are innumerable villas each in its own well-wooded garden. The view of the town from the sea is really enchanting. Leaving Torre Abbey and following the coast line there is a long panorama of beautiful buildings, hotels, and villas; and the terraces and architecture give the impression of an Italian seaside town. The town is built round the harbour, and it is interesting to see the water so close to the principal thoroughfares, especially when the water is dotted with boats and yachts. The flowers give ample testimony to the mildness of the climate. Even in February one can see out of doors the flower of the magnolia blooming beside the crimson camellia. The aloes flourish easily, and so do flax, myrtle, bamboo, and various sorts of palm.

There is an idea among those who do not know Torquay that because the climate is mild in winter it is hot in summer; but this is fallacious. Torquay is built on a promontory dividing Paignton from Babbacombe. The surrounding water of Torbay, together with the breezes from the hills, tend to keep this resort cool. The advantages of so equable a climate, so much natural beauty, and such ample provision for the entertainment and comfort of visitors make Torquay most suitable for physical treatment; and it is fortunate in possessing a splendidly equipped modern marine spa, under the control of the corporation, staffed by fully certified assistants. It possesses, too, in the Meadfoot Spring, a water having medicinal value.

Other Historic Beauty Spots

Moretonhampstead, on Dartmoor, near the eastern border, was originally a borough by prescription and formerly governed by a Portreeve. The annual courts, at one time held by the Earl of Devon, have been discontinued. A typical moorland town, its link with the past may be judged from the fact that its Charter for the market and two fairs was obtained by Hugh de Courtenay in 1335. The Church of St. Andrew, built of granite in the Perpendicular style, has two good stained-glass windows. The church register dates from 1603. George Parker Bidder, the famous calculator and engineer, a friend of George Stephenson, was born here in 1806.

Salcombe, at one time the home of J. A. Froude. Salcombe, is a charming place, set about one of the most delightful harbours in Devon. Visitors come to it in ever-increasing numbers and are enraptured by the beauty of the surroundings. Looking seawards one thinks of the treacherous natural bar across the harbour and recalls the poem *Crossing the Bar*, which it inspired. Here again one is in a district that has played its part in history. At Hope Cove, near by, one of the galleons of the Spanish Armada, *St. Peter the Great*, was wrecked, and Salcombe Castle, erected as a centre of defence for ports on this part of the coast, was at one time besieged by Parliamentary forces for four months, and only surrendered on honourable terms.

Powderham Castle, the home of the Courtenays, Earls of Devon, for nearly 700 years, stands on the western bank of the estuary of the Exe. It was built in the fourteenth century, and for long was strongly fortified. During the Civil War it was garrisoned by the King. In 1645 it was unsuccessfully attacked by Fairfax, but fell to Colonel Hammond the following year. The castle was originally a long parallelogram flanked at different points by six towers; four of these towers still stand and the other two have been rebuilt on the old sites. In the castle are some fine family portraits and a number of old masters. Conspicuous in the park is the Belvedere, a building erected in 1777 and consisting of three hexagonal towers seventy feet high, from which magnificent views of the surrounding country, as well as of the Channel and the River Exe, can be obtained.

Dartmouth is an ancient borough at the mouth of the famous River Dart, where, according to the Saxon Chronicle, Earl Beoru was slain in 1049 by Sweyn, son of Godwin, and buried in the church. It was at Dartmouth that William the Conqueror embarked in 1099 for the relief of Mans, and, on the occasion of the Third Crusade ninety years later, a hundred large ships and many smaller ones of the English squadron sailed from the port for Marseilles and Messina. The town furnished two vessels to fight the Armada and took sides in the Civil War. The corporation possesses some valuable insignia dating from about 1630, and seals of the thirteenth and fourteenth centuries. A market was granted to the town in 1226. The River Dart has been called the English Rhine, rather grandiloquently, but its scenery is comparable with that of greater and more famous streams. On the outskirts of Dartmouth stands the Royal Naval College, where cadets for the Navy are trained.

Widecombe is a quaint moorland town, the name of which is probably known among all English-speaking peoples because of the song "Widecombe Fair." This fair, of ancient origin, is very popular in these times because "Uncle Tom Cobley and all" continue to patronize it, though in convivial rather than business mood. The church was struck by lightning during divine service in 1638, four persons being killed and sixty-two injured when one of the pinnacles crashed.

Dartington Hall was originally given by William the Conqueror to William de Falaise, from whom it descended to the Champernowne family, who held it for many years. Under the direction of Mr. Elmhirst it has become a cultural and educational centre, where not only the arts but local industries are fostered. Remarkable developments have taken place in recent years, and visitors will find their visit one of deep interest, not unmingled with surprise.

Bude, a pretty and increasingly popular resort on the north coast of Cornwall, possesses a sandy level beach six or seven miles long with a depth of over a mile at low tide. The scenery, both coastal and inland, is arresting, and the air strong and bracing. A moated area known as Binhanmy Castle was, according to tradition, the site of a fortified residence built in 1335, and in the district are indications of an ancient Roman encampment. On the Broom Hill estate, near Bude, is Stamford Hill, where on May 16, 1643, a decisive battle was fought between the Parliamentary forces and a body of the King's troops, the latter, though much superior in equipment and strength, being completely defeated.

Tintagel, the reputed birthplace of King Arthur, has formed the basis of many romantic stories. Ruins of a castle, the legendary home of Arthur, on an eminence high above the sea, can be visited. The walls now standing are of rubble grouted with an extremely hard mortar, but are much worn, although some fragments of Norman work are to be detected. It is said that David, Prince of Wales, took refuge in the castle when in revolt against Edward I, and that John de Northampton or de Comberton, Lord Mayor of London in 1382, was imprisoned there. Two or three years later Thomas (Beauchamp), fourth Earl of Warwick, was also held a prisoner in the castle on his transfer from the Tower of London. Tintagel itself goes back to Richard Plantagenet, Earl of Poitou and Cornwall and King of the Romans. It returned two members of Parliament from 1552 to 1832, when it was disfranchised under the Reform Act, there being at the time only nineteen electors. The church should be inspected; several of the windows are of stained glass, one being to John Douglas Cook, editor of the *Saturday Review*, who is buried in the church.

Looe and Polperro are other popular places in the Duchy. Looe is considered to be one of the prettiest seaside towns in Cornwall, and Polperro is so quaint that it has provided the subject for numberless paintings. Looe can boast antiquities of much interest. The corporation insignia includes maces of silver-gilt, bearing the arms of Trelawnay and Seymour, punch bowls with the arms of the Buller family, and ladles with silver bowls and silver-mounted handles of twisted whalebone. There are also constables' staves nearly seven feet long. The cliffs at Looe command sweeping views of the Channel, and on a fine day it is entrancing to watch steamers of all sizes on their way to and from England as they "do business on the great waters." Polperro, a fishing village through which a stream runs, lies in a hollow between two rocky hills. It is a picturesque and peaceful haven, where are to be found a sturdy crowd of fishermen, and as their boats return to the tiny harbour to land the daily catch one thinks of their ancestors, who engaged in more hazardous voyages in the spacious days and played a humble but not unimportant part in shaping the destinies of this country.

Cotehele, on the banks of the River Tamar, is a district of exceptional beauty, and overlooking the river is Cotehele House, one of the residences of the Earl of Mount Edgcumbe. It is a most interesting mansion of the Tudor period, reputed to be the oldest dwelling-house in continuous occupation in England. There are two courts with an embattled gate-tower, and in the banqueting hall, with its fine timbered roof, suits of armour are ranged along the walls. The windows are enriched with the armorial shields of the Cotehele family, from whom the estate passed by marriage to the Edgcumbe family in the reign of Edward III. Tapestry is hung in most of the rooms. Attached to the house is a domestic chapel originally licensed as an oratory in 1411. In the grounds is another chapel erected in the reign of Richard III by Sir Richard Edgcumbe, during whose ownership the house played its part in the Wars of the Roses. A cenotaph in facsimile of Sir Richard's tomb at Morlaix, where he died in 1499 when ambassador to France, is in the domestic chapel.

The eighth international Congress of Thalassotherapy will be held at Montpellier-Palavas from June 3 to 5 under the presidency of M. A. Aimes, when discussions will be held on tuberculous peritonitis and the meteorological factors of sea climate. Further information can be obtained from the general secretary, 8, Rue André-Michel, Montpellier.

BRITISH MEDICAL JOURNAL

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THE ORIGIN OF CANCER

Enormous strides have been made in the past few years towards the elucidation of the cancer problem. They include three outstanding achievements, of which the earliest in point of time was the analysis of the part played by heredity in human cancer by Waaler, later confirmed by Wassink. Next came the synthesis of pure carcinogenic hydrocarbons by Kennaway and his colleagues, which not only identified the active carcinogenic agents in tar but laid bare the remarkable chemical relations which exist between carcinogens of this type and oestrogenic hormones and other constituents of the normal body. The third main achievement was that of Lacassagne, who showed that the development of mammary cancer in susceptible strains of mice could be accelerated and greatly increased in frequency by treatment with oestrin. These are not the only directions in which there has been progress; many suggestive observations have also been made in connexion with tumours in which a virus is concerned, but it is chiefly from these three discoveries that lessons have been learned which are applicable to cancer in man.

After such notable advances it is useful to consider afresh how the main question stands, and this *Journal* has published two general surveys of the subject, one by Dr. W. E. Gye (March 12, p. 551) and one in the present issue by Dr. W. Cramer (p. 829). Although ultimately divergent in the aspect from which they consider the problem, each of these develops his argument from a common thesis, which is fundamental and figures largely in the cancer literature of recent times. It is that malignant disease must be considered to have two causes—remote and proximate. Of possible remote causes there are many in the various chemical and physical stimuli which are known to lead to malignant change: once this change has occurred the further action of such a stimulus is unnecessary, and growth proceeds indefinitely not only in the individual affected but in others to which portions of the growth are transplanted. This behaviour is so entirely unlike that of any other tissue that it is reasonable to postulate some abnormal influence continually acting upon it, and this is what is meant by the proximate cause. It is the main argument of Dr. Gye's paper that this proximate cause is a living virus. Of certain malignant tumours in birds and innocent tumours in rabbits this is unquestionably true. Whether it is justifiable to transfer this conclusion to human cancer, in which no direct evidence of the existence of a virus has ever been obtained, is one of the most interesting and crucial questions in dispute at the present day. Other distinguished workers, such as Peyton Rous and C. H. Andrewes, have published long and closely reasoned arguments in favour of the hypothesis that when cancer arises in man, from whatever remote cause, the immediate and continued stimulus to proliferation is a virus which had previously been dormant in the body. An alternative hypothesis is that malignant change is an alteration in the properties of the cell itself, possibly connected with the known abnormal metabolic behaviour of malignant tissue. There is nothing inherently impossible in the conception that cells which have assumed the habit of unrestrained growth can continue it without perpetual stimulation by an extraneous agent.

An important line of reasoning developed in the latter part of Dr. Cramer's paper deals with the preventability of cancer, and it is illustrated by three examples of a type of growth amenable to preventive measures. The clearest-cut and least familiar of these depends on the recently observed association between simple achlorhydric anaemia in women and cancer of the mouth and oesophagus: it may be assumed that the efficient treatment of one will diminish liability to the other. Liability to cancer of the breast is so much greater with a positive family history that special precautions are clearly indicated. Whether the general public, and in particular women who stand in danger by reason of heredity, should be fully acquainted with the facts it is not easy to decide. Not only is it right that surgical policy should be influenced by the presence of this factor, but it has also been suggested that hormone treatment may prove capable of neutralizing the stimulus to malignant proliferation in the breast. The practical lessons to be deduced from the third example are more numerous, but for the average person less urgent; it is evident not only from Stevenson's work but from studies of heredity that cancer in exposed sites is conditioned by external causes, and depends less than any other type of growth on inherent susceptibility. These external causes are many, and the clearest of them are occupational. Dr. Cramer's final plea for a "follow-down system" merits serious consideration. Norway and Holland

have set us fine examples in the patient ascertainment of data bearing on the question of heredity. In the immense volume of effort devoted to the study of cancer in this country a place should be found for this analytical type of research on the broader basis which the "follow-down system" would require.

HEALTH IN PUBLIC SCHOOLS

The public schools of England, their good points and bad points, have been discussed by innumerable writers, great and small, particularly during the last century; we do not think, however, that as a class they have been the subject of a Stationery Office publication since the Royal Commission of 1864, when girls did not sport old school ties. Elsewhere in this issue we print a brief abstract of a Stationery Office publication—*Epidemics in Schools*—which is concerned with that aspect of public school life of special interest to our profession. It is a valuable document, the historical introduction to which is pleasant reading in these pessimistic times, because the contrast between hygienic conditions now and even a century ago is great, and it is made plain that the public spirit of the medical profession has been a powerful factor in the improvement.

The main object of the report, which is an interim report, is to give a precise account of the frequency and severity of disease, particularly infectious disease, in the schools. Although the period of observation is only five years, the data are so extensive that, so far as concerns the age and sex incidence of sickness and the attribution of time lost through sickness to various diagnostic groups, it is unlikely that further data would modify the impression conveyed. Differences as between particular schools and as between boys and girls in the aggregate are striking. Sometimes an obvious explanation suggests itself. That minor naso-pharyngeal infections—coughs, colds, and sore throats—should have a heavier statistical incidence upon girls than upon boys and upon younger than upon older children is not surprising; girls are likely to be looked after more sharply than boys, and young children are under closer supervision than the dignitaries of the sixth form. Why there should be a contrast in the incidence of serious illnesses such as otitis media, pneumonia, and acute rheumatism is less obvious. No doubt here, too, closer supervision plays its part. Again, droplet infection in sleeping quarters may be hindered by the greater use of cubicles or separate bedrooms in girls' schools. But the general problem is unsolved. Particular attention was given to the dynamics of the common epidemic diseases. Here also are unsolved problems. Scarlet fever was introduced many times, but there are only eight instances of ten or more cases, and in the largest outbreak (twenty-five cases) only 3 per cent. of those not previously attacked took the disease. It is common knowledge—the historical introduction gives specific instances—that in the days of our grandparents scarlet fever was a scourge of schools. The low fatality of scarlet fever now may perhaps be attributed to a change of type in the infecting organisms. How far this explains the low infectivity in school experience and to what extent improved sleeping accommodation and closer medical supervision are responsible are questions not yet satisfactorily answered. Turning to a directly practical matter, we note that the report expresses some fear that tonsillectomy is becoming a routine measure and doubts whether "this mass attack upon one of the normal structures of the body was justified." This is a subject upon which there is much to be said; the conclusion reached and the evidence upon which it is based deserve careful attention.

The committee has done pioneer work in epidemiological research and has had to fashion a new technique. Unlike psychological novelists, who make so many lurid discoveries in our public schools, it has no sensational results to record. The scientific pioneer does not expect to reach El Dorado in a day's journey: indeed if that city seemed to have been reached so soon he would know it to be a mirage. To the general reader, perhaps even to the medical reader, this volume of 288 pages may not seem of much interest. Probably few readers of the *Philosophical Transactions* 250 years ago gave more than a glance at Halley's Life Table or realized that a new organon had been forged. A page or two of figures are not exciting; many pages are soporific. Yet this report may perhaps date a new epoch as surely as did Halley's Table. It is the first example of pure co-operative research in the field of school hygiene. We do not undervalue the immensely important work of the national school service, that deals with numbers of young lives in comparison with which the statistics of all the public schools are puny. But this smaller population is mainly a boarding-school population, a set of semi-isolated groups the epidemiological history of which may in the long run provide solutions for fundamental problems of group disease. Hence we should be grateful both to the committee and to its numerous collaborators. The first stage of a long journey has been completed—a journey which will greatly increase knowledge of epidemiology in general and the hygiene of youth in particular.

HORMONAL REGULATION

The growth both of interest and of knowledge of the hormonal regulation of the body is exemplified by the publication of the reports presented to the "Journées Médicales de Paris Internationales" for 1937.[1] They form a volume of 850 pages, contributed by chemists, biologists, and clinicians, most of whom have been engaged in active research on the subject in different countries. Professor Carnot's introduction is perhaps somewhat of the nature of a rhapsody, but he rightly emphasizes the part in this advance that has been played respectively by work on the chemical structure of hormones, histological studies of the glands themselves, clinical observation, and particularly by the recognition of the mutual interplay between nervous and glandular mechanisms. All this has led to a much more accurate conception not only of the integration of the endocrine system but of the integration of the body as a whole. Even more, endocrinology is seen to have relationship with carcinogenetic substances, vitamins, and vegetable auxins, thus taking its appropriate place in a scheme of general biology.

Nothing has done more to clarify our views on the endocrine system than the realization of the manifold functions of the hypothalamus. Itself the mechanism controlling the expression of the emotions, it has ties on the one side with the cerebral cortex and on the other with the vegetative nervous system. In addition to this it is in such close relations with the pituitary body anatomically and physiologically that one may justifiably speak of a unit—the hypothalamic-pituitary apparatus. Indeed the nervous portion of this apparatus has even been observed to take on secretory functions after ablation of the glandular portion. This apparatus thus falls into line with the general law that nervous mechanisms operate through chemical intermediaries, or, as Hopkins phrased it, chemical substances locally produced interpret for the tissues the messages received from the nerves. Doubtless the endocrine glands exert an autonomous activity of their own; here, as Professor Loeper says in his admirably balanced summing-up, they work in silence and in secret. But we now see, as we did not at first, that this is only one half of the story. For through the sympathetic and parasympathetic, and also through the moderator action of the anterior pituitary, the whole endocrine system can be influenced by the central nervous system and mobilized for the benefit of the body as a whole. It is of course also true that the glands in their turn can influence the activities of the central nervous system.

All this and more is fully discussed in these reports, starting with Dr. Roussy's article entitled "Neuro-hormonal and Hormono-neural Regulation," but it is impossible to do more in the space at our disposal than to indicate the general trend of the discussions by this brief paraphrase. We must, however, call attention to Professor P. E. Smith's short communication, in which he deals with the great difficulty of visualizing the existence of such a large number of hormones as separate entities as has been claimed for the anterior pituitary. He finds a partial solution in the variations in the receptivity of the structures on which these hormones are called upon to act. This is the other side of the problem; the nature of the hormonal stimulus has been intensively studied, as these reports bear witness, but the study of the way in which the tissues receive the stimuli and differentiate between them has hardly begun.

[1] *Les Régulations Hormonales en Biologie, en Clinique et en Thérapeutique.* Paris: J.-B. Baillière et Fils. 100 fr.

THE FLAVINE ANTISEPTICS

There has recently been correspondence in this *Journal* on the merits and uses of acriflavine, which was of interest in reviving a long-standing controversy, dating indeed from the days of the war. This discussion was concerned simply with acriflavine itself, but acriflavine is only one of several antiseptics similar in composition and in action. The best known of these are rivanol (ethoxydiaminoacridine lactate), proflavine (2:8-diaminoacridine sulphate), and those antiseptics which consist of a mixture of 2:8-diaminoacridine and its methochloride. A mixture of these substances in the basic condition is known under the names of euflavine, trypaflavine, and neutroflavine, while a mixture of the corresponding hydrochlorides is acriflavine. The proportions in these mixtures are undefined and variable; hence the desirability of identifying a single substance having merits at least equal to those of the best samples of acriflavine. As in so many other fields of therapeutic research, by no means all related compounds, any of which may possess a similar and perhaps superior action, have been synthesized, and it is important that the properties of new compounds should be placed on record, even if they are not of outstanding merit, since such extension of knowledge allows useful conclusions to be drawn on the general relationship between chemical constitution and biological action. A. Albert, A. E. Francis, L. P. Garrod, and W. H. Linnell[1] have now reported the synthesis of ten new acridine compounds together with a study of their biological properties, from the points of view both of their capacity for killing or restraining the growth of bacteria and of their power to damage the body. From their results it appears that the science of antisepsis is far more complex than is generally imagined; an intri-

[1] *Brit. J. exp. Path.*, 1938, **19**, 41.

cate series of differences in effect is revealed, some of which have important bearings on clinical application. For example, of the bacteria tested *Streptococcus pyogenes* is decidedly the most susceptible to the action of all acridine antiseptics; *Ps. pyocyanea*, on the other hand, is unaffected by any of them, which means that one common type of wound infection is quite outside the scope of this treatment. The frequently quoted observation that serum actually enhances the antiseptic effect of acriflavine—instead of diminishing or even abolishing it, as is the case with agents of other kinds—is confirmed only to a limited degree and for the bacteria (which do not include *Str. pyogenes*) with which Browning originally observed this effect. Tests of toxicity by two methods in some cases gave contrasting results; it appears that a compound may be more lethal than another to the whole body, but at the same time less lethal to leucocytes, and this difference no doubt reflects a varying susceptibility of different tissues, corresponding to the similar variation observed among bacteria. These facts would influence the choice of an antiseptic for different purposes, one being more suitable for local application to a wound on account of its harmlessness to leucocytes, another for internal use, as in treatment aimed at the urinary tract, on account of the tolerance to it of the body as a whole. The main conclusion emerging clearly from this study is that the more efficient of these compounds will stop the growth of bacteria, or even kill them, in spite of the presence of blood or serum, in concentrations which do not prevent the activity of leucocytes as judged by either motility or the phagocytosis of bacteria. In this their claim is unique, and no class of antiseptic has a better title to be regarded as the ideal prophylactic, particularly against streptococcal infection. There is all the difference in the world between prophylaxis and treatment; the former is still the province of old-established antiseptics, while the purposes of treatment, for which antiseptic applications have never been really satisfactory, are now likely to be better served by other means.

ENZYME CHEMISTRY

Professor Carl Oppenheimer continues to work steadily at his task of summarizing recent advances in the huge subject of enzyme chemistry. During the past year he has brought out four more parts of the supplement to his encyclopaedic work on ferments and their action.[1] These parts complete the study of the proteases, deal with the desmolases, and begin the study of the zymases which cause the breakdown of hexose. Among the proteases considered are trypsin, pepsin, and thrombase. The outstanding advance recorded in the matter of trypsin and pepsin is their isolation in crystalline form by Northrop. Thrombase and blood coagulation occupy sixty pages, but although numerous minor advances are recorded few major discoveries have been made recently in this subject. The section on the desmolases opens with a review of modern ideas on the mode of oxygen uptake by cells, a subject that has developed very rapidly during the past few years. These enzyme systems are of dominant importance in biology, since they supply the energy which maintains the activities of the great majority of living forms. The uptake of oxygen by cells appears to be effected by chain processes; each process is complex, and several parallel mechanisms exist even in a single cell. The complexity of the subject is indicated by the fact that a tabular summary of the known hydrogen and oxygen "acceptors" occupies five pages. Oxidative mechanisms have lately engaged particular attention, and knowledge in this field has advanced with exceptional rapidity; the general result has been to reveal enzyme systems of a hitherto unsuspected complexity. It seems probable that an equal complexity will be found in other fields of enzyme activity when these are examined with equal care. The living cell is forced to work under very strict limitations as regards variations of temperature, osmotic pressure, etc., and these limitations appear the probable cause for the remarkably complicated nature of biological enzyme processes. This general tendency towards complexity rather than simplicity adds much to the difficulty of enzyme chemistry, and is one of the primary causes for the enormous output of writings on this subject. Oppenheimer's encyclopaedic work is the only comprehensive guide to this literature and is of corresponding importance.

[1] *Die Fermente und Ihre Wirkungen.* By Professor Carl Oppenheimer. Parts 6, 7, 8, and 9 of Supplement. The Hague: D. W. Junk. (10 Dutch florins each.)

BEE VENOM FOR ARTHRITIS

Tradition has it that bee-keepers are immune to rheumatism, and the sting of bees has for long been a popular remedy for sufferers from this disease, though it has only been employed by the medical profession during the last half-century. Since bee venom became available in a purified form its use by intradermal injection has grown more popular. The idea that the beneficial effects were due to formic acid was accepted for a long time, but recent research has shown that the explanation is less simple and that the action is analogous to that of snake venom. As with so many remedies, the value of published observations has been impaired by the unscientific way in which much of the work was carried out. The cases have not been carefully selected and defined, and controls have not been used. In such a disease as rheumatoid arthritis, which varies so much in severity and in which periods of improvement or quiescence often occur under favourable conditions without any special treatment, the difficulty of assessing the value of any remedy is great. Recently Kroner and a group of colleagues working in the medical department of Cornell University have carried out observations[1] on 100 patients. These were divided into three groups: in the first the disease was of an active and advanced type; in the second the condition was less severe but characteristic features were present—usually fusiform swelling of the finger-

[1] *Ann. intern. Med.*, 1938, **11**, 1077.

joints; in the third group there were no objective signs but there was complaint of pain in and tenderness of the joints. In all three there was an increased sedimentation rate. Definite improvement was observed in seventy-three patients, and seventeen were entirely free from symptoms six months to a year later. Naturally the proportion of improved cases was greatest in the least severe type, but benefit was experienced by six out of the ten most severe cases, with an improvement in the sedimentation rate also. No controls were used, but the results were compared with those obtained in a series of 103 patients treated by other observers (for example, by tonsillectomy and the administration of a haemolytic streptococcal vaccine); improvement was noted in 58.3 per cent. It must be noted that Kroner chose for the most part patients who had previously had a focus of infection removed, and in his statistics does not distinguish these from those in whom tonsillectomy was thought to be contra-indicated. All the patients were ambulatory; they were prescribed cod-liver oil, a diet rich in vitamins, and heat to the joints, and to this regime undoubtedly some part of the improvement must be attributed. The importance of rest and measures for the improvement of the general health without any specific treatment is shown by the results which were published by Pemberton.[2] He reported a series of 300 cases treated in this way; so effective was it that in a considerable number no other treatment was found necessary. The lesson is obvious, but a good case has been made out for a careful trial of treatment by bee venom in suitable cases.

[2] *J. Bone Jt. Surg.*, 1935, **17**, 879.

THE MIDWIFERY SERVICE

The report on the work of the Central Midwives Board for the year ended March 31, 1937, has been published by H.M. Stationery Office, price 4d. The period under review was one of far-reaching development in the midwifery service in England and Wales. It may perhaps be regarded by future generations as approaching very near in importance the year 1902, during which the first Midwives Act for England and Wales was placed on the statute book and the foundations were laid for the establishment of a well-ordered, properly trained profession of midwives. The report gives statistics of the number of women on the Roll of Certified Midwives (65,046) and of those in practice (16,648). The number actually engaged in the practice of the profession was thus little more than a quarter of the total. Of the midwives enrolled 63,543 were trained women. A report of the examinations held both for pupil-midwives and for midwives who wish to train pupils is included, together with notes of various decisions by the Board on midwives' training, etiquette, and practice. During the year under review the Minister of Health approved the revised training and examination rules, on the preparation of which the Board had been engaged for a considerable time. The two most important changes effected by the new rules are (*a*) an extension of the period of midwifery training, both for trained nurses and for other pupil midwives, and (*b*) the division of the course of training into two parts, each of which will be completed by an examination, those successful in the second being awarded the certificate of the Board and admitted to the Roll of Midwives. Rules have also been framed, and submitted to the Minister of Health for approval, regulating the post-certificate courses for practising midwives in accordance with the provisions of the Midwives Act of 1936. An important decision during the year was the permission given to midwives to administer nitrous oxide and air to women in childbirth under certain conditions. On the subject of teachers and teaching the report says:

"In the firm belief that the generally desired further improvement in the standard of skill and proficiency of midwives cannot be effected until there is an adequate supply of teachers possessing not only skill in the practice of midwifery but also teaching ability of a high order, the Board has devoted special attention to the question of how best to secure quickly sufficient teachers of the type required. Almost without exception the midwives who are responsible at the present time for the instruction of pupil-midwives are most skilful midwives, but unfortunately the most skilled practitioner is not always the best teacher. Some of the existing teachers do not possess any real aptitude for teaching; others would become good teachers if they were given the opportunity of receiving proper training in the difficult art of teaching. The main problems before the Board have been (i) how to discover the midwives who possess a natural aptitude for teaching and (ii) how best to instruct such midwives in teaching methods."

While the Midwives Act was in preparation and when it was before Parliament the Central Midwives Board had opportunities of conveying to the Minister of Health its views and suggestions on the various provisions. It is in complete sympathy with the aims of the Act and is confident that its provisions can be made the basis of a material improvement in the efficiency of the midwifery service. The Board has studied closely the requirements of the new domiciliary service of whole-time midwives and the effect of its establishment on other branches of the Board's statutory duties. At the end of July the headquarters of the C.M.B. were removed to larger premises at 23, Great Peter Street, Westminster, S.W.1.

FOOD POISONING FROM MILK

An outbreak of gastro-enteritis at Wilton, in Wiltshire, due to ingestion of contaminated raw milk, is described in a report issued last week by the Ministry of Health.[1] The outbreak involved about one hundred individuals, mostly school children, on October 28 and 29, 1936; it followed consumption of the milk at an interval of twelve to twenty-four hours, and was characterized by headache, nausea, vomiting, and later by diarrhoea, accompanied in some instances by much dehydration and collapse. The stools were frequent and watery, but contained neither blood nor mucus. The diarrhoea lasted for one to three days. Pyrexia of 99° to 103° F. in the initial stages was commonly noted; all the patients made rapid recoveries. Food poisoning from

[1] *Report on an Outbreak of Food Poisoning due to Salmonella, Type "Dublin," and Conveyed by Raw Milk.* Ministry of Health, London, 1938.

ingestion of preformed toxins, such as the toxin of *Staphylococcus aureus*, was thought unlikely, since a shorter interval—some three to four hours—is a characteristic feature of that condition; on the other hand, the absence of mucus and blood from the faeces and the rapid subsidence of symptoms were points against bacillary dysentery. Bacteriological examinations of the faeces were not carried out until six days after the onset and yielded negative results in every instance. From a specimen of the suspected milk on the second day a Salmonella organism, later identified as a "Dublin" type, was isolated, and four days afterwards a sample of milk from the same producer yielded a similar result. Confirmatory evidence that this was the causative organism was provided by the finding of high-titre specific agglutination of the organism by the serum of nine of the children during convalescence. The serum of three out of fifty-one cows showed the presence of specific agglutinins, but three examinations of milk were negative. On the other hand, the dung of one of these three cows repeatedly gave positive results. Although the blood of one of the workmen at the distributing dairy gave a positive agglutination reaction, the evidence pointed to the conclusion that he was a victim rather than the cause of the outbreak. Investigation revealed that, owing to certain defects in the technique of operation of the mechanical milking-plant, contamination of the milk could have occurred. Reference is made in the report to outbreaks of enteric fever, scarlet fever, and streptococcal tonsillitis in recent years, in all of which the infected milk had passed routine bacteriological standards for cleanliness. It is hinted that gastro-enteritis or "summer diarrhoea" in children may sometimes be attributable to milk or other food contaminated in this way. The main conclusion to be drawn from this particular outbreak is that all milk should be efficiently pasteurized before being passed on to the consumer. The objection usually advanced against general application of this measure has lost any weight it had, since it has been established beyond doubt that there is no significant difference in the nutritive values of raw and pasteurized milk.

CONFIDENTIAL CERTIFICATION OF DEATHS

In the February issue of the *Quarterly Bulletin* published by the Health Department of the City of New York (vol. vi, p. 16) reference is made to a new procedure to secure confidential certification of the causes of death, worked out by Mr. J. Duffield and approved by committees of the New York Academy of Medicine and the Five County Medical Societies. The certifying practitioner will be asked to furnish two certificates: one contains only a general statement of the cause of death—for example, "natural cause"; the other is a confidential report to be handed in a sealed envelope to the undertaker and to be transmitted by him to the Department of Health. This latter document must not be copied; the open certificate alone may be copied for legal or insurance purposes. Over an experimental period the new forms will be limited to the boroughs of Manhattan and the Bronx, so that the continued use of the old form of certificates in Brooklyn, Queen's, and Richmond may serve to test the value of the change. The experiment will be watched with interest. The details are not quite clear. It is stated that the name, age, sex, nativity, address, and other identifying particulars will appear on the open certificate. Presumably age, sex, nativity, and occupation will be required for the tabulation of the confidential data. We believe that in the Swiss system anonymity is secured by transmission to the Central Statistical Department unopened of a confidential report which does not record the name or address of the deceased. In fact the local registration official himself never sees the confidential particulars. The essence of such a system is absolute security against leakage.

THE INCISION FOR APPENDICECTOMY

In November, 1934, among correspondence in the desk of the late Dr. L. L. McArthur of Chicago was found a letter from Charles McBurney, written from Highgate Springs, Vermont, and dated October 10, 1894. Now in the John Crerar Medical Library of Chicago, this is a reply to a letter Dr. McArthur had written on August 24 of that year congratulating McBurney on the account of his muscle-splitting incision, which had appeared in the *Annals of Surgery* for July, 1894. With it Dr. McArthur had enclosed a copy of a paper describing the same incision, which he had been about to present to a meeting of the Medical Society of Chicago in the previous June. He had been unable to do so because of the length of the agenda at that meeting. Dr. S. W. McArthur of Chicago[1] describes this example of two men converging on the same line of work at the same time and unknown to each other. McBurney wrote of the muscle-splitting incision, "I think it is destined to supplant all other operations for the removal of the normal or of the chronically inflamed appendix." To-day it is also widely used for appendicectomy in acute cases and has its supporters the world over. Mr. W. H. Bowen[2] of Cambridge, however, reserves the McBurney method of approach for appendicitis complicating pregnancy, and in most cases prefers the pararectal incision introduced by the late W. H. Battle of St. Thomas's. Mr. James Sherren and other surgeons have been equally ardent advocates of the paramedian incision. These three incisions—the McBurney, Battle's, and the right paramedian—probably constitute the practice of the great majority of surgeons. Each has its advantages and disadvantages which are influenced by both the type of patient and the stage and type of the disease. Most surgeons of experience will probably agree that no one incision is to be slavishly adopted for all cases.

At the statutory meeting of the Royal College of Physicians of London held on Monday, April 11, Dr. Robert Hutchison was elected President in succession to Viscount Dawson of Penn.

[1] *Surg. Gynec. Obstet.*, 1937, **65**, 715.
[2] *Appendicitis. A Clinical Study.* By W. H. Bowen. Cambridge University Press. 1937.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

THE TREATMENT OF MINOR CONDITIONS IN THE EYE

BY

N. BISHOP HARMAN, F.R.C.S.

Conjunctivitis may be one of the minor diseases of the eyes, but it may be so severe as to constitute a major emergency and endanger the sight.

The conjunctiva is the delicate mucous membrane lining the inside of the eyelids and the exposed part of the eyeball. It is moistened by the mucin from its epithelium and by the tears, which pass from the lacrimal gland embedded under the outer prominence of the brow to the puncta at the inner canthus, and so down the tear duct into the nose. Since the membrane is exposed to the dust of all the winds that blow and to touching by dirty hands, it is liable to infection. The tears prevent many an infection, both by washing the eyes and also by reason of a dissolving effect they have upon germs.

Examining the Conjunctiva

It is easy to examine the conjunctiva lining the lower lid. It is not easy to do this for the upper lid and fornix unless the knack of everting the lid has been mastered. Yet the upper fornix is the more important by reason of its depth. To the practised hand the eversion is a simple and nice performance. Instruments should not be used; they alarm children. The lashes should not be employed as lifts; ladies dislike losing these adornments. All that is needed is the worker's own thumb and index-finger and *the patient's lower lid*. Stand facing the patient. Use the right hand for the left eye and the left hand for the right eye. Tell the patient to look down. Place the inner edge of the thumb parallel with the lower lid and on its outer half a quarter of an inch below the lashes. Lay the inner edge of the index-finger lightly on the upper lid, just above the lashes, and gently push up the skin; this will cause the edge of the lid to lift from the globe and pout a little. Now, with the thumb in position, slip the lower lid under the upper lid, and the thumb, following the lower lid, will get under the upper lid, which can be held firmly betwixt thumb and first finger and everted, even against a vigorous orbicular spasm. The secret of the trick is to make the lower lid serve as a wedge to get under the upper lid.

Conjunctivitis: Irritant

The delicacy of the conjunctiva allows the classical signs of inflammation to be clearly noted: redness from distension of the vessels, which, since they have little support, are apt to bleed; heat from the hyperaemia; swelling that may be a slight oedema or an intense chemosis, rendering the lids and globe immobile and the skin of the lids glossy; and pain, which is described as like "grit in the eyes," even to a severity as though broken glass were rolling under the lids. Besides these there is discharge, consisting of excess of tears, frothy secretion from the Meibomian glands, mucin from the epithelium, and escaped leucocytes. So there will be a muco-purulent, a purulent, or a sanious discharge according to the severity of the attack. Vision is always disturbed.

Conjunctivitis may be caused by local or by reflex irritation. Mild attacks follow exposure to wind, dust, smoke, fumes, or heat. Reflex irritation due to septic teeth, nasal douches, gastritis, or the taking of stimulating foods will produce the symptoms. Exposure to bright light, such as the arc lamp, ultra-violet rays, or snow-fields in the high Alps, will cause smart attacks known as "snow blindness." Drugs—for example, arsenic—are often excreted by the mucous membrane, and, if irritating, will produce conjunctivitis. Tired eyes from late hours or errors of refraction cause mild attacks, which, if repeated, may become chronic. In all these conditions discovery and removal of the irritant will be followed by improvement in the condition. The patient will be comforted by the use of a lotion of boric acid (2 per cent.) in laurel-water.

Conjunctivitis: Contagious

Conjunctivitis due to microbic infection is more common among children than among adults, and among dirty ill-kept folk than among those of cleanly habits. Two forms are common: (1) angular conjunctivitis; (2) "pink-eye." Angular conjunctivitis is a mild but chronic condition, causing redness of the lids, particularly at their angles, whence the name "angular." The ocular conjunctiva is but little affected. The secretion may contain minute bubbles, so that it appears like frothed white of egg; this is caused by the excessive blinking of the lids. When the lids are screwed up the secretion is squeezed out at the angles, where it erodes the surface epithelium of the skin. It is slightly more common with women than with men, and in adults than in children. The cornea is rarely affected. The organism causing the disease is a thick, square-ended diplobacillus; it stains well with aniline dyes, but is decolorized by Gram's treatment: it is easily demonstrated in film preparations, and grows on dried serum slants, liquefying the serum into deep sharp-edged pools of turbid fluid. The treatment of angular conjunctivitis is simple: zinc sulphate is a specific which may be used freely, either in 1/4 or 1/2 per cent. strength, as an eye lotion; or, better, it may be dropped into the lower eyelids with a pipette. It is the success of zinc sulphate in the treatment of this disease that has made it almost a household remedy for eye troubles. But, good as it is in this common form of conjunctivitis, it may be noxious in other types of inflammation.

The most common epidemic form of conjunctivitis is that known as muco-purulent conjunctivitis. It is very contagious. If one member of a family is infected all the members are likely to be attacked. It is the common "pink-eye" of schools. The occurrence of such an epidemic is a reflection upon the toilet arrangements of the home or school. The inflamed eyes show marked hyperaemia of the whole conjunctiva, there is a velvety look about the upper tarsal membrane, and minute haemorrhages will be noted about the loosely supported vessels of the ocular conjunctiva. The lymph follicles of the lids are swollen, and appear as slightly raised pinkish-grey bodies about one-half to one millimetre in diameter. The discharge shows pale greyish-yellow pledgets of muco-pus floating in the tears and collected in the lower fornix and lacus lacrimalis. Commonly the attack begins in

one eye and then affects the other. Sometimes the pre-auricular gland is inflamed. In severe cases, such as are seen in Eastern countries, the discharge may be profuse and almost purulent: sharp-edged crescentic ulcers, "catarrhal ulcers," erode the margins of the cornea, and sight may be damaged by their effects. In England they are rarely dangerous. The organism known as the Koch-Weeks bacillus is rod-shaped, and is minute and delicate. In most of its features and reactions it is like *H. influenzae*—in fact, some workers have sought to prove that the organisms are one and the same.

The prevention of pink-eye in schools depends upon attention to toilet arrangements. Each child should have its own handkerchiefs, towels, and brushes: exchanges should be strictly prohibited. Exclusiveness in clothing, toilet, and sanitary articles is the basis of civilized cleanliness. On an outbreak of the disease in a school or family those affected should be isolated. The unaffected may be further protected by the use of eye drops of zinc sulphate 1/2 per cent. morning and evening. The treatment of the disease should be initiated by the surgeon. The conjunctival sac should be washed out with boracic lotion and the everted lids, fornices, and particularly the folds of the inner canthus then painted with a solution of silver nitrate. The solution must be fresh; it works best and is less painful when it contains 20 per cent. of glycerin. The strength of the silver salt in solution should be 1/2 or at most 1 per cent. The silver solution should be applied by the surgeon. He should not order it as "drops" for the patient's own use. Patients have a habit of continuing treatment indefinitely. Silver salts if long used are absorbed and deposited in the elastic fibres of the submucosa, so that the conjunctiva and cornea may become stained blue-black (argyrosis). For the patient's own use a lotion of zinc chloride 1/8 per cent. is beneficial, and in the stages of convalescence recourse to the zinc sulphate drops is good practice. In no circumstances should lead lotions be employed. Lead is readily absorbed by an abraded cornea, and leaves a permanent white mark, which may obscure vision.

Ophthalmia Neonatorum

Purulent conjunctivitis is a severe and dangerous disease. In this country it is most often seen in infants. The eyes of the child are infected at birth by vaginal discharge. The gonococcus is responsible for the majority of the infections, but the streptococcus will produce disastrous results. Ophthalmia neonatorum usually begins about the third day after birth. The lids become red and swollen, and their edges stick together. On opening them yellowish pus exudes. The everted lids show a rich velvety mucosa. The cornea may be affected by ulceration, or it may slough, with consequent incurable blindness. The disease is preventable. Gibson of Manchester in 1807 recommended that: (1) the leucorrhoea of the mother ought, if possible, to be cured during pregnancy; (2) when this has not been done the noxious secretion ought to be removed from the vagina during delivery; (3) the infant's eyes ought, immediately after birth, to be cleansed with a fluid which either removes the noxious matter or is able to prevent its injurious effects. That is the treatment of to-day. The disease is notifiable: "A purulent discharge from the eyes of an infant commencing within twenty-one days from the date of its birth must be notified" (L.G.B. Order, 1914). The measures taken to prevent and treat the disease have materially reduced the tale of blindness among children. They are:

1. Directly the head of the infant is born wipe the eyelids dry with clean cotton-wool. Use a fresh piece for each eye.

2. As soon as the mother is settled wash the infant's eyelids freely with a simple lotion—boracic or Condy 2 per cent. Run the fluid freely between the lids. The water for the child's first bath must not get into its eyes. Separate water and a fresh towel must be employed for the infant's face. At no time may the mother's toilet articles be used for the child.

3. If at delivery there is a suspicion of a purulent discharge from the vagina of the mother cleanse the baby's eyes as suggested, then instil a drop of silver nitrate 1 per cent. between the lids. The eyes must be examined and washed after eight hours, and if there is a suspicion of discharge make and stain film preparations for microscopical examination. The gonococcus is easy to demonstrate with methylene-blue staining: the groups of biscuit-shaped cocci within the leucocytes are characteristic.

Treatment consists in: (1) cleansing; (2) use of a germicide. Special nurses must be put in charge or the child should be taken into hospital, preferably with its mother. The surgeon in charge should never omit to examine and note down the state of the cornea as soon as he sees the case. The cleansing is the chief part of the treatment. The eyes should be washed free from pus every hour and irrigated every four hours with plenty of boracic lotion. Syringes and large irrigators are dangerous. Retractors should not be used. The lids should be parted with the fingers and the lotion run in from a cotton-wool swab or with an undine, the nozzle of which is protected with rubber tubing. The silver nitrate solution, 1 per cent., or other chosen germicide should be painted over the conjunctiva once a day by the surgeon. Gonorrhoeal conjunctivitis in adults is now very rare. It is usually due to the transfer of urethral discharge by the contaminated fingers. The symptoms are intense, and the danger to sight is grave. Such a case should be removed to hospital immediately.

In outlining the treatment of conjunctivitis "painting" the lids has been mentioned. Brushes should not be used for this purpose. They are rarely surgically clean, and the hairs are apt to get loose. The surgeon should make a fresh cotton-wool brush for each eye treated. Take a wisp of cotton-wool about the size of a postage stamp and a tapered glass rod or a thin wax taper. Hold the cotton-wool between the tips of the left thumb and finger, press the end of the rod upon the wool, then lightly pinch the wool on to the rod and twist the rod at the same time. The wool will be securely twisted on to the rod.

Hyperaemia as a Diagnostic Symptom

Pink-eye, or hyperaemia, is a symptom common to many diseases of the eyes: it is therefore necessary to be able so to read other signs as to determine the real nature of the trouble. Three diseases may be named: acute conjunctivitis, acute iritis, and acute glaucoma. All cause hyperaemia, pain, and disturbance of sight. Age liability will be some distinction. Conjunctivitis is most common in children, iritis in young adults, and glaucoma in elders. But the most valuable distinction is to be found in the state of the pupil. If the pupil is mobile the disease is probably conjunctivitis; if the pupil is small and irregular it is probably iritis; if the pupil is enlarged, slightly oval, and immobile glaucoma may be present. When examination with a magnifying-glass does not make the condition clear, the test should be done with a mydriatic. Put one drop of 1 per cent. homatropine within the lower lid of the eye and let the patient rest

with the eyes closed for half an hour. If then the pupil is found to be dilated evenly and well the condition is certainly not iritis. If the pupil has dilated but little and its outline is irregular, there is iritis. If the pupil has dilated with almost alarming rapidity there is likely to be glaucoma, and then the mydriatic should be neutralized immediately with eserine. (Atropine should not be used for this test, since it is such a powerful mydriatic that it cannot be neutralized by eserine.) Of all the means of differential diagnosis the state of the pupil is the most valuable and also the most objective.

Lacrimal Obstruction: Infants

On occasions a baby will be brought for examination with the complaint that an eye has been inflamed since birth. The infant may be a few days to a fortnight old. The unwary may jump to the conclusion that this is a case of ophthalmia neonatorum. Examination of the eyes will show that the condition is quite different. First, it will be noted that one eye is healthy and the other is in a messy state. The lid margins are clogged, and mucus and pus hang about the inner canthus. When the discharge is wiped off with cotton-wool the eye and lids will look healthy except that the conjunctiva will be too wet. If now the little finger be pressed down between the inner canthus and the nose the reason for the trouble will be shown: muco-pus will regurgitate from the lacrimal puncta. The trouble is due to obstruction of the lacrimal duct which carries the tears from the sac into the inferior meatus of the nose. The lacrimal duct develops as an epithelial cord which becomes embedded in the nose and is then canalized. A plug of epithelial debris may block the duct.

TREATMENT

For a fortnight the effect of drops, such as zinc chloride 1/8 per cent., may be tried. The mother should be taught to increase the natural pumping action of the lid movements. The infant is laid on its back and some warmed lotion is poured into the hollow of the inner canthus. Now the lower lid is pulled outwards away from the nose; this brings the cord of the tensor tarsi into action, and so opens the sac and sucks the lotion into it. The little finger is then pressed down on the sac, the contents of which are forced down the duct. If this treatment fails, the duct must be syringed through with plenty of fluid. One operation is usually successful. A general anaesthetic is needed. The lower punctum is stretched with a dilator, a rod the size of a dance-programme pencil with a tapered blunt-pointed end. The dilator is pressed downwards into the minute hole of the punctum for one millimetre; then the handle is depressed so as to be parallel with the lid margin, and with a rolling movement the dilator is insinuated a little way into the canaliculus, so that both this and the punctum are stretched without being split. The nozzle of a lacrimal syringe is now passed in the same way: first downwards; then inwards until the nozzle can be felt pressing upon the wall of the sac against the nasal bones; and, lastly, the body of the syringe is raised to lie alongside the nose with the nozzle pointing down the duct. The contents of the syringe are driven out. If the fluid passes into the nose it runs back into the throat, and the child will be seen to swallow.

Lacrimal Obstruction: Adults

Epiphora, or a watery eye, is an annoyance. In certain walks of life it may be a real danger to the sight of the eye. Any interference with the muscular mechanism of the lids or the position of the puncta, or any obstruction to the drainage apparatus, will cause tears to flow over the cheek. It may be an after-effect of facial paralysis, of chronic blepharitis, or of scarring of the lids. Obstruction in the duct is due to some nasal trouble. There may be disease of the nasal bones from syphilis; it has been known to follow periostitis arising from dental disease, and it may be caused by fracture of the nose from falls or blows. In some cases nasal catarrh may spread upward into the duct and cause more or less temporary obstruction. Apart from the annoyance of the condition it is dangerous when it occurs in those whose work renders them liable to exposure to dust or flying specks, such as smiths or road-makers. A septic sac will infect a corneal abrasion, and a hypopyon ulcer, with the loss of the sight of the eye, may follow.

In any complaint of epiphora first note the position of the lids and puncta, then test the patency of the tear passages. Place within the lower lid a fragment of dry fluorescein, close the lids, pinch the nose to make the tears flow, then "pump" the tears down the duct (as described in the section dealing with the infant). If the passages are normal the stain will pass into the nose and can be blown out in a minute or so. If the stain does not come through the duct may be explored by: (1) syringing; (2) probing.

The method of syringing has been given above. In cases in which there is inflammatory swelling of the mucous lining of the duct regular syringing with hydrogen peroxide, 5 volumes, will often effect a cure. In cases of long duration, where there is a mucocele in the sac, and especially if the contents are purulent, there is probably an organic stricture either of the bone or of the lining membrane. The suspected stricture should be searched for with a probe. Use a drop of cocaine and adrenaline. Then after dilating the punctum pass the probe as directed for the nozzle of the syringe. When the probe is in the duct slide it down gently until the stoppage can be felt. If it is elastic it is probably membranous; if it is tough and resistant it is probably bony. In the latter case there is no doubt as to the proper procedure. The sac, canaliculi, and the remnants of the duct should be extirpated by operation, or a passage from the sac directly into the nose may be made by a plastic operation. When the stricture is probably membranous the decision as to treatment is more difficult. To force the stricture by probes and then leave it will be useless, for the subsequent scarring will be denser than before. If the probe can be gently insinuated through some part of the stricture there is a prospect of success by long-continued syringing. It is dangerous to syringe immediately after passing a probe: a false passage may have been made, and the syringing will drive the possibly septic contents of the tear passages into the cellular tissues and may set up acute cellulitis. A leaden style, solid or hollow, may be passed down the duct if a probe will dilate it sufficiently without force. The upper end of the lead is lipped over the lid to prevent it slipping down. Styles may be worn for months without discomfort, but they must be removed periodically and cleaned. In most such cases it is better to remove the sac or make a direct passage into the nose. Some plastic operations succeed well, though there may be trouble from the puffing up of the tissues when the nose is blown. After removing the sac and blocking the canaliculi the excess of tears gradually ceases, and there is no inconvenience, except in cold winds or emotional states.

EPIDEMICS IN PUBLIC SCHOOLS

A STATISTICAL ANALYSIS

The committee whose interim report is now published[1] was appointed by the Medical Research Council eight years ago under the chairmanship of Sir George Newman, who when he retired was succeeded by the present Chief Medical Officer of the Ministry of Health, Sir Arthur MacNalty. The reasons which led the Council to take this step were, first, that much experimental work had been done—largely under the auspices of the Council—on the phenomena of infectious disease spreading in communities of mice and, next, that careful observations had been made and recorded of similar phenomena in a boarding school of a certain type. It seemed desirable, therefore, to test the analogies suggested by laboratory experiment and the findings of a particular set of observations of human beings, in a wider field—namely, a representative sample of British public schools.

The committee was fortunate in securing the co-operation of many schools, and this report is an account of the first five years' investigations. Section I (the work of Dr. L. R. Lempriere, a member of the committee) is a most interesting historical account of the hygienic conditions of various great public schools through the ages. In the next section is described the elaborate system of recording adopted in the twenty-one boys' schools and ten girls' schools which participated. The average numbers per term under observation were 10,270 boys (8,287 of these in boarding schools) and 3,503 girls (3,061 of these in boarding schools). In all, 22,166 boys and 7,600 girls came under observation for one or more terms. Sections III to XIX treat of special clinical groups—namely, nasopharyngeal infection, sore throat, rheumatism, otitis media, sinusitis, pneumonia, influenza, tonsillectomy, infectious diseases, the relation between chicken-pox and herpes zoster, gastro-intestinal disorders, appendicitis, jaundice, tuberculosis, trauma, conjunctivitis, and tinea cruris.

Method of Analysis

The general method of analysis may be illustrated by the lay-out of the chapter on nasopharyngeal infection. For this survey the diagnoses influenza, sore throat, cold, P.U.O. and chill, and cough were chosen; these are also shown as totals, two totals being given—namely, including and excluding influenza (a very large contributor). First we have a general table of attack rates for boarding schools (sexes, of course, shown separately); then tables of terminal attack rates and of weekly rates (boarding schools), a number of graphs, and rates for separate schools. Finally, the records of boys (in six schools) under observation continuously for at least three years are analysed with the object of discovering whether boys who suffered much (or little) from colds at, say, the age of 13 had a heavier (or lighter) incidence of colds at the age of 16. It was found that no relation could be proved to exist between the records—that is, what happened at 13 exerted no influence on what was to happen at 16. This method of arrangement is, so far as practicable, followed in the subsequent chapters, so that it will be sufficient to refer later to striking results noted in the general summary. Section XX very briefly refers to mortality. Since only forty-two boys and eight girls died this section is a mere matter of record. Section XXI is a very complete account of time lost and sickness in age groups, both for the whole population and individual schools—a most valuable piece of documentation. Section XXII (by Dr. F. Griffith, a member of the committee) reports bacteriological findings. Thus of 199 instances of otitis media and mastoid disease the organism was not determined in sixty; in eighty cases *Str. pyogenes* (type was determined in sixty-one) and in fifty-nine a pneumococcus (type determined in forty-seven) were responsible.

[1] Medical Research Council Special Report Series, No. 227. H.M. Stationery Office. (4s. 6d. net.)

Illness Rates in the Sexes

In Section XXIII—a general summary—it is first noted that, as the data were limited to illnesses which caused at least one day's absence from school, the great difference in rates in boys and girls for minor respiratory illnesses might be due rather to stricter surveillance than to greater susceptibility. A similar possibility has to be considered if the decreasing attack rate with age is attributed to natural immunization. It might be that younger children are more likely to be kept out of school than the older and less strictly supervised pupils. "Only the accurate reporting of every cold, whether causing loss of school time or not, would tell us to what extent natural immunization is operating, and we gravely doubt whether there is any practicable method of obtaining such data." Not only influenza but many other diseases (otitis media, pneumonia, sinusitis) have a maximum in the Lent term. Trauma among boys is maximal in the Christmas term, when general sickness rates are usually low (although the gastro-intestinal group is highest in that term). Among boys 90 per cent. of infectious diseases (measles, German measles, chicken-pox, whooping-cough, mumps, scarlet fever, and diphtheria) are equally divided between the first two terms of the calendar year: among girls more than 60 per cent. of the cases were in the Lent term.

The ability of infectious diseases to work themselves out before the end of term varied greatly. About half the epidemics of measles may be said to have come to a natural end, but no epidemics of German measles and few epidemics of mumps, chicken-pox, and scarlet fever could be said to have ended before the holidays began. "It is impossible to explain this phenomenon on any theory dependent on the number of susceptibles exposed to risk, since examination of an adequate sample shows that about 70 per cent. of public school boys have had measles, chicken-pox, and whooping-cough before entry, about 30 per cent. have had German measles and mumps, and less than 10 per cent. have had scarlet fever; the corresponding figures for the girls are somewhat lower, but of the same order. One might say that with an almost unlimited supply of susceptibles—usually 70 to 90 per cent. —outbreaks of German measles, mumps, and scarlet fever might be expected to drag on until the end of term; but there is no obvious reason why epidemics of measles should tend to behave differently from those of chicken-pox in this respect, since the proportion of susceptibles is approximately the same—about 30 per cent.—for these two diseases."

The Question of Artificial Immunization

It is remarked that while one may be excused for regarding those who have not passed through a clinical attack of measles, German measles, chicken-pox, or mumps as "susceptible," this can hardly apply to scarlet fever. In one school 30 per cent. of 366 boys (out of 425) were found Dick-negative and about half the entrants in subsequent terms. The test has proved relatively unreliable in the hands of many workers who used it with the object of artificially immunizing positive reactors. In view of the fact that scarlet fever has never attacked more than 3 to 4 per cent. of the "not previously attacked" in this experience, it is doubted whether the advantages of artificial immunization in a public school outweigh the disadvantages. With regard to the relation of chicken-pox to herpes zoster, it is shown that on eighteen out of twenty occasions when zoster preceded chicken-pox the first case of chicken-pox might, from the point of view of time, have arisen out of the case of zoster. The data of influenza, disregarding the experience of a single school, show no evidence of an actively acquired immunity lasting for as long as a year.

Influence of Tonsillectomy

About half the population was found to have had the tonsils removed, and the proportion so treated was increasing. No satisfactory proof that tonsillectomy as a routine measure diminished the incidence of nasopharyngeal infections was obtained. "Though realizing the value of the operation in carefully selected cases, we have grave doubts as to whether the majority of tonsillectomies performed to-day are the result of true discrimination rather than of routine ritual." The difficulties of interpreting sex differences have already been mentioned, but the greater stringency of reporting could hardly account for differences in such serious infections as otitis media, pneumonia, and acute rheumatism: the two former are more than twice and the last eleven times as frequent among boys as among girls. Closer supervision of minor illness and less close contact in sleeping quarters are possible factors. "We believe that it is of the utmost importance that every effort should be made to discover the underlying cause of this fundamental difference in experience between the sexes, so that the boys may, if possible, be freed from this heavy incidence of diseases which always cause anxiety and may produce serious disability or even death."

ROYAL MEDICAL BENEVOLENT FUND

ANNUAL MEETING

The annual general meeting of the Royal Medical Benevolent Fund took place on April 5, with Sir Thomas Barlow, its president, in the chair. The financial statement was presented by Dr. L. G. Glover, the honorary treasurer, who said that subscriptions and donations were up by £1,739 as compared with the year before, but legacies had fallen by nearly £3,000. In explaining an increase of £300 in income tax recoverable under deeds of covenant Dr. Glover said that the Medical Insurance Agency, which was in the habit of giving the Fund £1,600 a year, had come to the conclusion that it might equally well undertake a covenant to give that sum annually for seven years and so enable income tax to be recovered on the amount. On the expenditure side 431 maintenance grants had been made, amounting to £12,125, and 236 annuities, amounting to £6,248. The total distribution, including special grants, some of them on behalf of other societies, and the Christmas gifts, was over £22,000. The investments of the Fund stood, at purchase price, at just over £200,000. One of the most encouraging things that happened last year was the response to Sir Thomas Barlow's Christmas appeal, which brought in £979, and enabled each of the beneficiaries to receive thirty shillings. Another interesting happening was the Davis bequest; it was not possible to carry out the letter of the testator's wishes, but the spirit would be met by allocating the invested income for the benefit of those helped by the Fund who were in need of a holiday or treatment in a nursing or convalescent home at the seaside. Dr. Glover also presented the financial statement of the Ladies' Guild, which, he said, had done more work than ever before in its thirty years' history. Mr. R. M. Handfield-Jones, the honorary secretary, said that for a long time the Fund had been compelled by force of circumstances to limit its grants to the inadequate amounts of £40 for men and £26 for women, but now there were at least twenty-five beneficiaries who were receiving more than £50 a year, and several were receiving £100.

The report was adopted on the motion of Dr. Glover, seconded by Dr. Herbert Spencer. The president, treasurer, and honorary secretary were re-elected on the motion of Sir D'Arcy Power, seconded by Professor Grey Turner, and on the motion of Dr. C. O. Hawthorne, seconded by Mr. Handfield-Jones, the members of the committee of management, who retire by rotation, were re-elected, together with Dr. N. G. Horner, Dr. Egbert Morland, Mr. C. P. G. Wakeley, and Dr. Henry Robinson, who was nominated by the Medical Insurance Agency. Dr. Hawthorne said that the three editors had the opportunity of speaking week by week to the whole of the medical profession of the country, and had frequently used the opportunity in the interests of medical benevolence. He also welcomed the addition to the committee of Dr. Robinson, who was chairman of council of Epsom College and chairman of the Charities Committee of the British Medical Association. Sir Thomas Barlow proposed an omnibus vote of thanks to the British Medical Association and its Charities Committee, the Medical Insurance Agency, the Medical Sickness, Annuity, and Life Assurance Society, the Ladies' Guild, and the medical and lay journals. He said that the Fund had very good friends. He, too, welcomed the editors of the medical journals, saying that their presence on the committee would help to identify the work with the profession generally throughout the country. It was stated that it was the intention of the committee, instead of issuing a formal report, to send a personal letter to all the subscribers and donors explaining again the objects of the Fund and describing the year's work.

New Beneficiaries

At a recent meeting of the committee nineteen annuitants were elected, the total amount voted being £545. In addition forty-five beneficiaries (eight new applicants) were awarded grants amounting to £1,120. The following are particulars of three cases:

Widow, aged 69, of M.R.C.S., L.R.C.P., who died in January. Under the will the property and personal effects were left to the widow, but the estate consisted solely of the house now occupied, a 1934 10-h.p. car, and the household furniture. After the sale of the house, etc., and after outstanding debts had been paid, it was expected that the capital remaining would not exceed £300. The widow had received no money since her husband's death. The Fund sent an immediate gift of £5, and has voted a further £46 for this year.

Widow, aged 83, of L.R.C.P. and S., who died in 1915. The widow is living with her two sisters. One sister, a skilled nurse, looks after the widow and her other sister, who is also an invalid. The doctor in attendance reported that the widow was suffering from arthritis and was completely crippled, and emphasized the need for the widow to have a permanent attendant, but her financial position would not allow of this. The Fund voted £26.

Doctor, aged 65, wife, aged 48. The husband is suffering from progressive muscular atrophy. The Fund voted £80 per annum to him and £26 per annum to his wife. The shipping firm for which he worked as a surgeon is contributing £30 per annum.

New annual subscribers are urgently needed by the Fund. Cheques may be sent to the Honorary Treasurer, Royal Medical Benevolent Fund, 11, Chandos Street, Cavendish Square, London, W.1.

In December, 1937, the French Minister of Labour established in Paris an institute for the study and prevention of occupational diseases. This institute, the first of its kind in France, includes not only a modern, well-equipped examination room, but also a laboratory permitting extensive chemical and toxicological research and a special photographic laboratory. A library offers to its readers literature, bibliographies, and all specialized publications in French, English, Dutch, German, and Russian, as well as the publications of the International Labour Office. A complete catalogue classifies under the various headings all published articles dealing with the subject of occupational pathology and hygiene. The institute, directed by Dr. G. Hausser, includes on its scientific board such well-known French scientists as Professors Balthazard, Tiffeneau, Duvoir, Étienne-Martin, Fabre, Kohn-Abrest, Laugier, Godard, and Mazel. A publication appearing every two months, *Archives des Maladies Professionnelles, d'Hygiène et de Toxicologie Industrielles*, will include scientific papers and a complete bibliographical section. The address of the Institut d'Étude et de Prévention des Maladies Professionnelles is 6, Rue de la Douane, Paris, Xe.

Reports of Societies

SPREAD OF STREPTOCOCCAL INFECTION

At a meeting of the Fever Hospital Medical Service Group of the Society of Medical Officers of Health in London on March 25 a discussion was held on the spread of streptococcal infection as ascertained by type determination. Dr. J. A. H. BRINCKER was in the chair.

Dr. V. D. ALLISON (Ministry of Health Pathological Laboratory) referred to the classification of haemolytic streptococci into groups by Lancefield's precipitation method, the importance of group A in human disease, and the identification within this group by Griffith of some twenty-six serological types using specific agglutinating sera. The multiplicity of types was of real help in tracing the sources and paths of the spread of infection, while group classification was of little value in this connexion, as by it one could not free from suspicion subjects who might be harbouring group A streptococci of types other than those causing the outbreak under investigation. The main value of type determination in infections caused by *Str. pyogenes* was in (1) the investigation of the source and paths of infection in explosive outbreaks of streptococcal infection, due, for example, to milk, and in outbreaks of puerperal fever in maternity homes and hospitals; and (2) the investigation of the paths of spread of infection in the wards of general and fever hospitals, and of the effects of reinfection and cross-infection as the cause of grave complications. The advantages of type determination had been well exemplified in many outbreaks, some of major importance, during the last few years—for example, the Denham, Chelmsford, and Doncaster outbreaks caused by milk infected with *Str. pyogenes*, the source of infection being definitely established in each instance. In numerous outbreaks of puerperal fever the identification of the infecting strain had given a clue leading to the discovery of the source of infection.

Quoting from his own experience Dr. Allison said that epidemiological investigations of streptococcal infections in multiple-bed scarlet fever wards and in cubicles had proved conclusively certain facts:

1. Patients nursed throughout their illness in cubicles or chambers show no change of the serological type of the infecting streptococcus. Segregation of patients in small wards according to the serological type of the infecting streptococcus revealed that if a change of type did occur it was due to the introduction of fresh infection by a member of the ward staff.

2. Infection with one serological type of *Str. pyogenes* does not necessarily protect a patient against infection with another type.

3. The so-called "relapse" in scarlet fever is due to fresh infection with a streptococcus conveyed by another patient in the ward and differing in serological type from that causing the primary infection.

4. In multiple-bed wards for scarlet fever 50 to 70 per cent. of the patients become reinfected with one or more fresh types of *Str. pyogenes* during their stay in hospital.

5. Such reinfections may be "latent" or "manifest."

6. Complications in scarlet fever occurring during the third week and subsequently in multiple-bed wards are in the great majority of cases caused by reinfecting types of *Str. pyogenes*.

Dr. Allison quoted experimental proofs of spread of infection by direct and indirect contact, and pointed out the importance of infected toys, handkerchiefs, and eating utensils as vehicles of infection. Air-borne infection by droplets was also a well-recognized means of spread, but the part played by dry dust particles, in which *Str. pyogenes* could survive for a considerable time, was only beginning to be recognized. Exposure of blood-agar plates for short periods in scarlet fever wards and examination of the resulting cultures indicated a surprisingly high degree of air infection with *Str. pyogenes*. The types isolated from the air were exactly those found as infecting agents in the patients in the ward. Finally, Dr. Allison showed that the problem of the spread of streptococcal infection was of equal importance in measles wards and in the wards of general hospitals. In the epidemiological investigation of streptococcal cross-infection in a measles ward over a period of seven weeks, *Str. pyogenes* was isolated at some time during their stay in hospital from thirty-five out of forty-three patients, and in twenty-two cases had resulted from cross-infection occurring in the ward; of seventeen cases of otitis media in the series eight were due to cross-infection with types of *Str. pyogenes* from other patients in the ward.

Air-borne Infection

Dr. R. CRUICKSHANK (L.C.C. Group Laboratory, North-Western Hospital) spoke on air-borne infection. By this he meant not "droplet" or "spray infection," which had only a very limited spread, but the dissemination of bacteria by the air. Recent epidemiological and bacteriological work suggested that infection—and not only respiratory tract infection—was spread in spite of rigid precautions to prevent transference manually, by fomites, or by carriers. Wells in America had shown that droplets expelled into the air by coughing and sneezing did not always fall immediately to the ground within a few feet of the individual. If the droplets were not more than 0.1 mm. in diameter, evaporation rapidly reduced them to so small a compass that they remained suspended in the air like particles of smoke. Larger droplets or other infective material that had settled might also be evaporated and lifted into the air again as dust. The potentiality of these "droplet nuclei," as Wells called them, for spreading infection depended, among other factors, on their viability and their concentration. Wells found that certain organisms which commonly occurred in the upper respiratory tract—for example, haemolytic streptococci, pneumococci, and *C. diphtheriae*—remained viable in the atmosphere for two days, whereas intestinal bacteria such as *Bact. coli* and *Bact. typhosum*, died off within eight hours.

Dr. Cruickshank went on to give examples from his own experience of the air-borne spread of streptococcal infection. On one occasion it was found that eight cases of burns in the same ward were infected with the same type of *Str. pyogenes*, that the dust and atmosphere of the ward contained numerous haemolytic streptococci, and that a strain isolated from the dust was of the same serological type as that obtained on culture from an infected burn. Great care was taken to prevent manual spread from case to case, and throat carriers among the nursing staff were not common. The second example was that of a small outbreak of puerperal sepsis in which throat carriers and direct transference could be almost certainly excluded; again the epidemic type of *Str. pyogenes* was found in the atmosphere of the ward. The occurrence of streptococcal infections (tonsillitis, otitis media, and vaginitis) in a diphtheria ward of young children furnished the third example. In addition to the clinical infections most of the children had haemolytic streptococci in the nose or throat, more particularly in the nose), whereas there were no carriers among the nursing staff. Haemolytic streptococci of the two infecting types were present on plates exposed in the ward and were most numerous where the infected cases were occurring (although the plates were beyond the reach of "droplets"), and after the dust of the ward had been stirred up by sweeping and dusting. In conclusion Dr. Cruickshank suggested that the nursing staff should not be blamed too readily for the spread of infection, that too much dependence should not be placed on "bed-isolation," and that "wet" dusting should be the routine practice in "infected" wards.

General Discussion

Dr. R. A. O'BRIEN thought that some of the findings mentioned by the previous two speakers might be open to criticism if they were based on the examination of a single swab from the patient on admission. Mr. T. B. LAYTON commented on the tendency to remove otitis cases from scarlet fever wards in order that they might be isolated, and observed that it was not the otitis case which required isolation but the pre-otitis cases. Dr. F. GRUNDY said that however desirable the practice of swabbing and typing of streptococci might be from a scientific point of view, information thus obtained might be misinterpreted in a court of law if an action were brought against a local authority in consequence of cross-infection. With regard to cubicle and chamber nursing, he thought it should be remembered that a policy which was practicable in large infectious diseases hospitals might be quite impracticable in the case of the vast majority of small isolation hospitals in this country. Some attempt might be made in these small hospitals to reduce the incidence of so-called relapses in scarlet fever by avoiding any overcrowding of the wards and by grouping cases in such a way that convalescents without complications were not brought into contact with newly admitted acute cases. Dr. A. TOPPING suggested that there was a tendency to attribute the occurrence of puerperal sepsis in a case to a nurse or midwife who happened to harbour a haemolytic streptococcus in her throat or nose without excluding other more likely causes; the *post hoc ergo propter hoc* theory, if adopted without full investigation, could lead to entirely wrong conclusions.

Dr. E. H. R. HARRIES referred to C. V. Chapin's classical *Sources and Modes of Infection* (1910). Chapin discounted the importance of air-borne infection, and stressed the part played by droplet spray and by utensils and the hands of attendants. It was at one time believed that by aerial convection the virus of small-pox might be transmitted to the unvaccinated over distances such as a quarter of a mile. If dry-sweeping was permitted in wards then clouds of dust were inevitable. Damp-sweeping, or better still the use of vacuum cleaners, was an essential part of the technique of bed-isolation. Nobody would intentionally admit patients in the early stage of chicken-pox or measles to a bed-isolation ward. The infectious conditions most safely managed in these wards without spread were those due to the haemolytic streptococcus. Patients suffering from scarlet fever, erysipelas, or puerperal sepsis had in his own experience been nursed at the same time in the same ward under bed-isolation conditions without spread of infection to other patients. Nevertheless, other factors remaining unaltered, it was possible so to increase the load of streptococcal infections in the ward that the system broke down and cross-infection occurred. Dr. Harries stressed the importance of Sheldon Dudley's conception of the "velocities of infection."

Dr. SLEIGH, medical officer of health, Chatham (late medical officer of health, Chelmsford), discussed the Chelmsford outbreak mentioned by Dr. Allison. A curious feature of the outbreak was that of thirty-three cases of scarlet fever with onset in the fortnight previous to the milkman infecting the milk, twenty-eight received their milk from the infected source. They were late notifications, and so were not typed; but this suggested that the milk had been infected earlier, that the milkman was infected from his own milk, and that passage through the human host had raised markedly the virulence of the strain, leading to the explosive outbreak. Typing had been continued since the outbreak with the assistance of Dr. Camps, and it was found that in a comparatively small district there were seldom more than three or four types at any one time. All cases showing secondary rises of temperature were re-typed, and always showed a different type from that obtained on admission. Recently all his cases were kept in bed till they were fit for discharge. This had lowered considerably the amount of cross-infection. Typing also helped in separating out true "return cases." A case had been admitted as a probable case of mastoiditis due to Type 6 streptococci. The condition cleared up and he was discharged. Within thirty-six hours he had to be readmitted, almost moribund, and died within twenty-four hours of streptococcal meningitis. On typing the pus from the brain it was found to show streptococci of Type 1; there were no other Type 1 cases in the hospital at that time. In regard to swabbing midwives' throats he thought that unless the streptococci found could be typed it was unwise to take swabs at all.

Dr. J. MCGARRITY stressed the value of fresh air and bed-isolation in ordinary wards, and deprecated overcrowding. In Birmingham there were three bed-isolation wards where all sorts of doubtful cases were isolated. In these wards cross-infection had not been seen at all during recent years. The technique of bed-isolation was most carefully carried out and the windows were wide open all the time, both night and day, even in the winter. The temperature of the ward did not matter; the patients could easily be kept warm with the help of extra blankets and hot-water bottles. Dr. E. C. BENN (Leeds), speaking of the immunity of Dick-negative reactors to streptococcal infections, said that a fall in the relapse rate of scarlet fever to less than 1 per cent. followed artificial immunization by scarlet-fever toxin of those children who remained Dick-positive in the second week of the disease. He also mentioned the frequent occurrence of streptococcal tonsillitis in fever nurses during the first four or six weeks of hospital service. As their immunity to streptococcal infection increased, either naturally from exposure to infection or as a result of artificial immunization, the incidence of streptococcal tonsillitis showed a sharp fall. Dr. M. MITMAN conceded the possibility of aerial contamination by suspended infectious particles, but thought that if it occurred it was in most instances the result of droplet spray. Infection in the air or dust became diluted rapidly as the result of drying, the action of sunlight, and the movement of air in a well-ventilated ward. In consequence the mass of infection was usually insufficient to initiate an attack of the disease. Direct droplet infection was still the most important mode of transmission of infectious diseases. In investigating the contamination of the atmosphere with suspended particles he suggested, as a possible alternative to the elaborate air centrifuge, a blood-agar plate moving slowly in a vertical direction through the air. An adjacent stationary plate would provide evidence of infection from falling particles. In this way a comparison between floating and falling particles could be obtained. He believed that Dick-negative subjects were, on the whole, more resistant to haemolytic streptococcal infections than Dick-positive ones. An individual, in acquiring immunity to the antigens of the toxin, must also have had an opportunity of acquiring some immunity to the antigens of the organism itself, such as those responsible for its invasive properties. Although the Dick test was no measure of this bacterial immunity, a negative result indicated a previous acquaintance with the organism. Differences in the behaviour of the same type of streptococcus gaining access to the body through different portals of entry was attributable, he thought, to differences in local immunity.

SILICEOUS DUSTS

At a meeting of the Society of Public Analysts and Other Analytical Chemists, held at Burlington House on March 6, Dr. H. E. COX presented a paper on the chemistry and analysis of henna. He described the constituents of the henna leaf, and pointed out that, contrary to some earlier literature, henna did not contain tannin. The constituent to which its dyeing properties were due was 2-hydroxy-1:4-naphthaquinone. This substance, alone or in henna powder, could be very satisfactorily determined by means of a volumetric method and apparatus described. The dyeing of hair with the hydroxynaphthaquinone depended on the *p*H value of the liquid. It required an acid reaction, and no satisfactory dyeing could be obtained in neutral or alkaline solutions. This was probably why curious defects or colours sometimes appeared in hair dyed with henna.

Dr. JANET W. MATTHEWS gave an account of work carried out in collaboration with Professor H. V. A.

Briscoe, P. F. Holt, and P. M. Sanderson, the main object of which was to investigate the characters of dusts liable to produce silicosis. Two methods devised for collecting dusts from air in mines and factories, without contact with moisture, were described; in one the air was filtered by suction through a layer of salicylic acid crystals which were subsequently removed by solution in absolute alcohol, and in the other the air was passed through a long chamber ("labyrinth") divided by baffles into numerous compartments in which fractional deposition took place. Microchemical methods employed in analysing the dusts were briefly described. It was found that siliceous materials were much more hygroscopic in the form of fine dust than in the macro-form, and that in the former condition an appreciable quantity of their silica becomes soluble in water. Dusts of calcined flint and asbestos, for example, which were dangerous in respect of silicosis, yielded 12 mg. and 30 mg. of silica per gramme to 100 ml. of water, while cement and sillimanite dusts, which were regarded as innocuous in respect of silicosis, yielded only about 1 mg. The effect of addition of other materials to the siliceous dusts was investigated, and it was found that admixture with an equal proportion of lime greatly reduced the quantity of silica dissolved by water.

CHRONIC CERVICITIS

At a meeting of the Edinburgh Obstetrical Society on January 12, with the president, Professor JAMES HENDRY, in the chair, Dr. G. DOUGLAS MATTHEW read a paper on the treatment of chronic cervicitis.

Dr. Matthew said that some degree of cervical laceration was a common accompaniment of labour, whether spontaneous or instrumental, and this predisposed to cervical infection. Cervicitis in its chronic form was seen characteristically in the multiparous patient with a history dating from a previous confinement. While the majority of cases arose in this way, others followed abortion, instrumental trauma, or direct gonococcal infection. Cervicitis led to much suffering, discomfort, and ill-health, and the outstanding symptoms were pain, discharge, and menstrual irregularity. In some cases urinary symptoms might result from bladder irritation, or involvement by actual infection, while in others the cervix might act as a focus of infection in coexistent systemic disease. There was a definite connexion between chronic infection and carcinoma of the cervix. He believed that some sort of classification of cases was of assistance in the selection of suitable treatment for the individual. He suggested division into the following four groups: superficial cervicitis; endocervicitis with erosion; endocervicitis; and diffuse cervicitis.

The aim of treatment was to eradicate all infection and repair laceration and eversion. The final result should be a smooth, supple cervix with a patent canal. Treatment might be conservative, by douching by the local application of antiseptics or caustics, or by ionization; thermal, using the methods of cauterization, electrical coagulation, or diathermy excision; radiotherapeutic; or surgical. He had had the opportunity of using many of these methods in the treatment of patients under the care of Professor Johnstone in the wards of the Royal Infirmary during the past two years. From the results obtained and from a consideration of other methods, he had arrived at certain conclusions as to the best form of therapy to be used in each of the four types of cervicitis which he had described. In superficial cervicitis he recommended superficial electrical coagulation without dilatation of the cervix. This could be done in the out-patient department. In cases of endocervicitis with erosion he advocated excision of the affected tissues by diathermy after full dilatation of the cervix. This treatment should be carried out under anaesthesia with the patient in hospital. Bourne's zinc-chloride method might be the ideal treatment for cases of uncomplicated endocervicitis, and diffuse cervicitis was best treated by surgical excision and repair of the cervix, or by amputation in older patients where pregnancy was unlikely.

Dr. Matthew concluded by referring to the treatment of cases during the post-natal period, and mentioned results which had been obtained at the Royal Maternity Hospital with electrocauterization six to eight weeks after delivery. He believed that as this post-natal treatment became more universally adopted the number of patients attending gynaecological out-patient clinics with symptoms of chronic cervicitis would gradually diminish.

At the same meeting Mr. HUGH MILLER (Inverness) reported in detail a case of unruptured tubal pregnancy continuing to full term.

BUNDLE BRANCH BLOCK

A meeting of the section of medicine of the Royal Academy of Medicine in Ireland was held on March 18, with the president, Dr. E. T. FREEMAN, in the chair.

Professor HENRY MOORE, with Drs. E. KEENAN, W. R. O'FARRELL, and M. A. MORIARTY, made a communication on bundle branch block. Of 2,080 patients examined electrocardiographically thirty-seven showed bundle branch block, an incidence of 1.77 per cent., and eight an indeterminate form of intraventricular conduction defect, the QRS wave being more than 0.12 second in duration. Thirty-five cases gave the common curve of bundle branch block, two the uncommon type of curve. The heaviest incidence was in the sixth decade, and 62 per cent. were males. The aetiological factor was apparently vascular hypertension in twenty of the thirty-seven cases, and disease of the coronary arteries without hypertension in five. It was possible to trace thirty-six of these patients; 60 per cent. were dead, the average duration of life since the diagnosis was made being 20.4 months, but four patients had lived for more than six years. The presence of intraventricular block was suspected on clinical grounds in twenty-one out of twenty-six cases; such a block was present but clinically unsuspected in five cases. The diagnosis could only be made with certainty, however, by the electrocardiograph.

Findings at Necropsy

Four cases came to necropsy; the hearts were carefully studied in serial sections, the whole conducting system being followed down to the finer ramifications of the bundle branches in order to discover the interrupting lesion and so to obtain evidence as to whether the new or the old nomenclature for the electrocardiographic diagnosis of bundle branch block was correct. Using the new electrocardiographic nomenclature, Case 1 had right bundle branch block, Case 2 had left bundle branch block, Case 3 originally showed a left bundle branch block but later the curve became indeterminate in character, and Case 4 showed an indeterminate form of curve throughout. In Case 1 a fatty fibrotic lesion interrupted the right bundle branch; in Case 2 a fibrotic lesion had destroyed the left branch; in Case 3, in addition to some congestion of the trunk with, however, apparently healthy fibres, an old fibrotic lesion almost completely destroyed the left branch, and a lesion of more recent origin (mainly congestive and to a slight degree fibrotic) caused interruption of a minority of the right bundle branch fibres. The fourth heart (indeterminate form of intraventricular conduction defect) showed no lesion interrupting the conducting tissues down to the finer ramifications of the bundle branch subdivisions, but there was a round-celled infiltration of about 2 mm. in circumference at the base of the papillary muscle in the right ventricle, and there was a small old infarct at the apex of the left ventricle. On the whole the results suggested that the new nomenclature was correct. The pathology of the myocardium and coronary arteries was also studied and described.

About 220,000 sections were cut on the four hearts. The anatomical and pathological part of the work was carried out under a grant made by the Medical Research Council of Ireland.

General Discussion

The president, Dr. E. T. FREEMAN, said that this was the first account which had been presented to the Academy of any work that had been done with monetary help from the Research Council. Dr. P. O'FARRELL said that he had seen eleven cases of bundle branch block, all in males; ten were of the common type, one of the rare type. Of these patients six had died within two years—three of them died suddenly—three were alive, and two he had not been able to trace. It was possible that bundle branch block might be an expression of coronary disease.

Dr. W. J. E. JESSOP and Dr. ALAN THOMPSON also took part in the discussion, to which Professor MOORE replied.

At the same meeting Dr. C. J. MCSWEENEY showed a new and improved model of the Bragg-Paul pulsator.

Local News

FRANCE

[FROM OUR OWN CORRESPONDENT IN PARIS.]

The Medical Examination of all Motor Drivers

Hitherto in France a special medical examination has been required only of the drivers of motor lorries, omnibuses, and other heavy motor vehicles. The extension of this privilege or imposition, call it what you like, to the drivers of all motor vehicles has recently been debated with much keenness at meetings of the Academy of Medicine, which has finally decided in favour of it, in spite of the misgivings voiced by several speakers. The resolution adopted on March 8 says, in effect, that such a medical examination would be useful for every driver and necessary in the interests of all motorists. It concludes with the proposal that the Minister of Public Works should appoint a commission to examine this problem. The critics of this measure within the Academy dwelt on the difficulties which would be encountered when a limited number of medical examiners would be called on to deal with an unlimited number, running into millions, of candidates for medical certificates. It was also pointed out that motor accidents are more often due to flaws in a man's character than to flaws in his physique, and that one cannot expect the ordinary medical examiner to be gifted with such transcendant psychological insight that he can "spot" the road-hog in advance. One speaker quoted statistics supposed to show that only 0.74 per cent. of road accidents had been traced to the faulty physique of the driver. On the other hand, there must be many physically ailing motorists, including elderly country doctors, whose earnings would be seriously threatened by the proposed measure, although the likelihood of such drivers causing a serious accident would be very small indeed. What was perhaps the most effective answer to all these inhibitory considerations was the question put by one speaker: "Is there a single one of our colleagues who would consent to be driven from Paris to Nice by an epileptic chauffeur?" It is remarkable how such a pertinent question can crystallize opinion during a debate conducted with so much ability on both sides that many a listener must have felt that both were in the right, or very nearly so.

The late Dr. Raimond Sabouraud

Though many obituary notices fail to carry conviction because of the well-known and on the whole laudable inclination of the writer to give his subject the benefit of the doubt one cannot help being charmed and impressed by the volume and quality of the tributes paid by his friends to the late Dr. Sabouraud. He is a remarkable illustration of the proverb, imputed to a certain biblical whale, that you cannot keep a good man down. From the very outset of his medical career Sabouraud was recognized as a coming man. Then a rude check awaited him: a thesis which he had prepared on the subject of ringworm and which represented four years' research was rejected by his examiners in favour of another thesis whose comparative mediocrity was obvious. This judgment, a mere incident for the examiners, made Sabouraud decide once and for all not to seek promotion by the usual paths, but by the intrinsic merit of his own researches. For some time this decision cut him off from the laboratory and hospital appointments that normally go to those who best succeed in pleasing their examiners. But with the support of Roux and others Sabouraud was enabled to pursue his studies as a bacteriologically minded dermatologist, and in due course the importance of his work was so universally recognized that the hospital appointment he had refused to seek sought him, and he was installed at the Saint-Louis Hospital, where for some thirty years he was the presiding genius to whom the whole world of dermatology came to pay homage. But with all his success he remained the kindly, genial, modest, helpful man at the service of all who sought his advice. The motto up to which Sabouraud lived throughout nearly the whole of his scientific career was: When you are someone, you need not be something.

Insurance against Professional Risks by Sou Médical

Sou Médical is a co-operative enterprise, all of the profits of which go to swell a reserve guarantee fund. For an annual subscription of 100 francs each its members are insured against all the risks entailed by the practice of medicine. The lively appreciation of these risks by the medical profession is shown by the fact that in only two years the membership of this body has risen from 7,019 to more than 8,000. In 1937 it dealt with 461 affairs, 109 of which concerned disputed doctors' bills. Third-party actions accounted for twenty-two cases, medical care at road accidents for twenty, occupational accidents for fifty-eight, conflicts with the tax authorities for seventy-five, and misunderstandings between colleagues for twelve. There were eight cases of slander and four penal cases. Only about 10 per cent. of all the cases dealt with in 1937 would have been taken up by an ordinary insurance society confining its liabilities only to professional responsibilities. Sou Médical is linked up with the weekly journal *Concours Médical*, the annual subscription to which is 70 francs. Thus for a total of 170 francs every French doctor who wants to can enjoy a first-class medical journal and insurance against the almost countless risks of legal troubles in this highly contentious age.

Retirement of Professor Emile Sergent

When a medal was presented to Professor Sergent recently on the occasion of his retirement several among his most distinguished colleagues recalled various incidents in his career. Professor Roger went back some thirty-seven years and called to mind his first meeting with Professor Sergent, when, in 1901, they had sat opposite each other at an examination table. A fellow examinee whispered on this occasion to Professor Roger: "Look at his head! He is going to be Potain's successor!" This remarkable prognostication came true, and for many years Professor Sergent drew crowded audiences at the Charité where Potain had taught. Professor Sergent's gifts as a teacher were so conspicuous that in 1921 a unanimous vote of the council of the Faculty of Medicine endowed him with a new chair, as professor of clinical propaedeutics at the Charité. He was not only a great teacher, however, he was also a brilliant research worker who has contributed much to our knowledge of endocrinology, the diseases of the respiratory system, and tuberculosis of this system and of the bile passages.

Correspondence

Classification of Adventitious Sounds

SIR,—I have been much interested in the correspondence on this subject, and especially by Dr. Hutchison's letter in which he pleads for simplification. Personally I always taught my students the original classification of Laennec with as exact an English translation as possible. He introduced the word *râle*, which he derived from the "death-rattle," but he explained that he would take a rather wider application of the word than the accepted one:

"Je désignerai sous ce nom tous les bruits contre nature que le passage de l'air, pendant l'acte respiratoire, peut produire soit en traversant des liquides qui se trouvent dans les bronches ou dans le tissu pulmonaire, soit à raison d'un rétrécissement partiel des conduits aériens."

There is no doubt that he used the word *râle* in the widest possible sense that attaches to the English word "rattle." Laennec goes on to distinguish five principal kinds of *râle*—as follows:

1. Le râle humide ou crépitation.
2. Le râle muqueux ou gargouillement.
3. Le râle sec sonore ou ronflement.
4. Le râle sibilant sec ou sifflement.
5. Le râle crépitant sec à grosses bulles ou craquement.

The two English translators, Herbert (in 1846) and Forbes in his fourth edition of 1834, used the following English equivalents:

	Forbes	Herbert
1.	Moist crepitous rhonchus or *crepitation.*	Moist crepitant rale or *crepitation.*
2.	Mucous rhonchus or *guggling.*	Mucous or *gurgling* rale.
3.	Dry sonorous rhonchus or *snoring.*	Dry sonorous rale or *snoring.*
4.	Dry sibilous rhonchus or *whistling.*	Dry sibilant rale or *whistling.*
5.	Dry crepitous rhonchus, with large bubbles or *crackling.*	Dry crepitant rale with large bubbles or *crackling.*

These three lists will show how much confusion Dr. Forbes caused when he introduced the word "rhonchus," saying it was employed by Laennec; but I cannot find that Laennec used it as a complete equivalent of *râle*. In the "table alphabétique" to the second edition of Laennec's *Traité de l'Auscultation Médiate* (1826) there is the entry "RHONCHUS, RONFLEMENT *voy.* RÂLE"; but this implies that *rhonchus* is identical with *ronflement*, or "snoring." Unfortunately Forbes's translation met with wide acceptance, and his substitution of *rhonchus* for *râle* has served to puzzle every medical student from that day to this.

A reversion to Laennec's original classification is perhaps the best simplification, provided that the word *râle* is frankly translated by "rattle." With that substitution Herbert's version of the classification will be intelligible. Whether Laennec's division of "rattles" into dry and moist is justifiable must remain debatable.

It has always seemed to me that whilst one may accurately describe sounds as gurgling, whistling, snoring, and crackling, to call them "wet" and "dry" involves more guesswork than is acoustically or musically permissible. I am not sure whether *craquement* is accurately rendered by "crackling," the word used by both Forbes and Herbert: Laennec explains that it is the pathognomonic sign of pulmonary emphysema, is only heard during inspiration, and resembles the sensation experienced when one presses the stethoscope over a part affected by subcutaneous emphysema—so perhaps "crackling" is the right word.

There is really no difficulty in finding English equivalents for Laennec's five sorts of "rattles," with the exception of his first *râle humide ou crépitation*. The word "crepitation" is not in common English use: Laennec says the sound is like that caused by making salt crackle by warming it slightly in a basin or by blowing up a dry bladder. He explains the sound as caused by "the air vesicles containing a liquid almost as thin as water which does not prevent the air penetrating them. The bubbles which form it appear extremely small." This is the crepitation heard in the early stages of pneumonia, which disappears during complete consolidation of the lung, and reappears (as Laennec described) when resolution occurs. "Crepitation" thus described and defined seems to be a word which we must allow to be adopted into English. With these original explanations which Laennec used we shall do well, in my opinion, to be content. But if we are compelled to read Laennec in a translation, not in the original French, I recommend Herbert's translation, not Forbes's.—I am, etc.,

Clifton, Bristol, April 5. J. A. NIXON.

Ascorbic Acid in Bronchial Asthma

SIR,—Dr. H. B. Hunt's article (*Journal*, April 2, p. 726) concludes by saying that his investigations do not show "ascorbic acid to be of any value in the treatment of bronchial asthma when given in comparatively large doses." There are ample reasons for questioning this statement. Clinically one knows and patients themselves have emphasized the benefit to asthmatics of plenty of fresh fruit. Secondly, the adrenals are richer in vitamin C than any other organ in the body. Thirdly, the urinary excretion of ascorbic acid for twenty-four hours was investigated in thirty-two asthmatic patients at Stobhill Hospital. In twenty (60 per cent.) it was *nil*, and the average excretion of the remaining twelve patients was only 4.8 mg., the highest being 12 mg. (normal, 15 to 30 mg.). Of course, the series is small and belongs to the hospital class, in which the excretion of ascorbic acid is likely to be low, but surely it is significant that in all the patients the figure was so far below normal, sometimes even after eating fruit.

The mode of action of ascorbic acid is admittedly obscure; as regards asthma it is probably indirect but none the less potent. It has some relation to vascular spasm. The last two cases of Ménière's disease that I saw promptly got well on taking abundant fruit. The urine of one was examined and contained no ascorbic acid. Ménière's disease is the aural analogue of migraine, though, unlike migraine, it does not often coexist with asthma.—I am, etc.,

Asthma Clinic, Stobhill Hospital, Glasgow, April 6. JAMES ADAM.

After-effects of Modern Treatment of Carcinoma

SIR,—The original account by Mr. Percy Furnivall which led to this correspondence served to show from his own experience that the results of radiotherapeutic treatment, like those of other forms of treatment, cannot be stated simply as success or failure according to the survival or death of the individual treated. By his own case-history he demonstrated that the elimination of cancer from certain situations by radiotherapeutic treatment may be associated with such a degree of persistent pain that survival may scarcely be desirable. Surgery likewise, although successful in the sense that the disease has been

eradicated, may also demand a heavy price, in disablement, from the survivor. Few radiotherapists of experience would seek to deny that considerable room for improvement exists both in technique and in the assessment of cases in their comparatively young branch of medical science.

Some of those whose letters followed Mr. Furnivall's have unfortunately expressed exaggerated likes or dislikes for radiotherapy. Either of these attitudes can serve only to retard that co-operation between surgeon and radiotherapist which their respective limitations and the gravity of the subject demand. Dr. Douglas Webster (March 26, p. 699), for example, undoubtedly overstates the case for radiotherapy, while Mr. W. S. Dickie (April 2, p. 757) verges on the intemperate in his criticism from the supposed surgical point of view. If all Mr. Dickie's cases were treated "by recognized experts" and "all had necrosis of soft and bony tissue," then something was wrong with his recognition either of necrosis or of experts. From the tone of Mr. Furnivall's note it is evident that he only sought to state facts within the range of his own intimate knowledge, and had no intention of disparaging radiotherapy or of encouraging others to do so. The pursuit of this branch of treatment to a high standard is difficult from many standpoints—practical, economic, and administrative—and the number of well-qualified men in training in this country at the moment is inadequate. The painful aftermath of the elimination of disease in Mr. Furnivall's case may possibly serve as a stimulus to the establishment of the team work which is the chief promise of future developments in the attack upon cancer.—I am, etc.,

Edinburgh, April 4. J. J. M. SHAW.

SIR,—Mr. W. S. Dickie's letter (April 2, p. 757) scarcely does justice to modern radium therapy. I think everybody must feel grateful to Mr. Percy Furnivall (February 26, p. 450) for so generously giving the results of his own personal and rather painful experience. But looked at in the light of after-events there can be little doubt that he received an overdose. Such warnings as that given by Mr. Furnivall and in the letter from Mr. Dickie serve to emphasize the fact that in dealing with radium as a substitute for surgery we are making use of a powerful weapon, capable of doing harm as well as good and, in dealing with large malignant growths, only safely made use of by team work. Such a team should be composed of a surgeon, with practical experience not only of operating in the area involved but of the effect of the application of radium, assisted by a pathologist, and with the dosage controlled by an expert physicist, who may or may not be styled a radium officer.

One important principle I think is now being established—that it is unwise to vary the types of irradiation in one and the same case, or, in other words, "Do not mix your methods." The worst results I have seen were in two cases in which necrosis of the larynx took place, and in one in which the face necrosed; all were treated first of all with radium needles and subsequently by heavy doses of deep *x* rays. Assuming that the position of the growth and the degree of malignancy, as shown by the microscope, remain constant, there is still a considerable variation in the soil in which it grows. It is probable that the surrounding parts offer a resistance to invasion which differs in the individual. Further, when the soil has been damaged by years of absorption of alcohol, or has been affected by syphilis, or even impoverished in its vascular supply by arteriosclerosis, it easily undergoes necrosis. Each case should be carefully judged on its merits at a consultation between the surgeon and the radium officer, when the size and distribution of the growth will be estimated, as will the character of the soil in which it is found and the proximity to bone. Experience has shown that some bones are much more prone to radium necrosis than others, and it is my own practice in dealing with the fauces, whenever the growth approaches the ascending ramus of the jaw, to remove it and attack the growth from the outside. I think this simple procedure would have saved a great deal of the distress and suffering to which Mr. Dickie refers in his letter.—I am, etc.,

Birmingham, April 8. MUSGRAVE WOODMAN.

Causation of Cancer

SIR,—In the *British Medical Journal* of February 24, 1934 (p. 352), there appeared a letter of mine on cancer research in which I suggested that the key to the prevention of cancer lay in the reinstatement by simple means of man's natural resistance to the development of the disease. It seems to me that what we know about this disease as it occurs in man shows that the search for a so-called "cancer cure" is a futile one, and only tends to raise hopes for the future which can never be realized. In connexion with the question of cancer prevention, it is necessary clearly to visualize the fundamental difference between cancer genesis and cancer growth. We know now, both from clinical and experimental evidence, that man and animals possess a natural resistance to cancer genesis varying greatly in different individuals. As a general rule the younger the individual the greater is the natural resistance to cancer genesis and the more rapid the actual growth of the cancer. It is obvious that cancer genesis and cancer growth do not run on parallel lines, and consequently it can be readily understood that certain agents which have no effect upon the established disease may nevertheless influence the development of the morbid process.

I think that with our present knowledge of physiology it is not beyond the wit of man to visualize the mechanism of the natural resistance to cancer genesis and, furthermore, to conceive of simple means which will assist this mechanism to function at its inherent optimal potency. In recent years it has been demonstrated that various agents—chemical, actinic, and animate—possess carcinogenic properties. I believe that certain chemical compounds contained in these substances, or produced by their action on the body, enter the system and act by diminishing the natural resistance to cancer genesis, and that the tumour site is determined by local irritation. In this connexion it is suggestive that a chemical compound may have a markedly carcinogenic action and yet may produce little, or even no, local irritation. I think that in the conception of cancer as a preventable disease lies our real hope for its future control.—I am, etc.,

Cardiff, April 5. W. MITCHELL STEVENS.

To Nail or Not to Nail Abduction Fractures?

SIR,—In the *Journal* of April 9 (p. 773) Mr. H. A. Brittain disagrees with my view and Böhler's (who thought of it first) that abduction fractures should not be disimpacted and nailed but should be allowed to join spontaneously in the usual slight valgus deformity. I am certainly an advocate of nailing, but not a blind advocate. I restrict the operation to those adducted subcapital and

transcervical fractures which are notoriously reluctant to unite by any other means. I do not, however, operate upon patients previously bed-ridden or upon those with a short expectation of life, still less as a cure for pneumonia.

The three-flanged nail has its disadvantages. Though Smith-Petersen's nails increase the chances of union, they slow it down considerably and make it difficult to decide when it has occurred. They break completely across in 8 per cent. of cases and, in addition, pieces chip off in about half this proportion. Nail erosion is so common that nobody mentions it. I say nothing of osteo-arthritis and aseptic necrosis because these may occur without any operation, but there are occasions when the risks of leaving a nail or removing it seem almost equal. Surely it is better to get union without using a nail when, as in pertrochanteric, intertrochanteric, and abduction fractures, one can feel confident of doing so? Mr. Brittain's claim of 85.7 per cent. bony union in all cases lacks the support of dates, but Watson-Jones, at Belfast this year, frankly admitted that his figure of 91 per cent. (*British Journal of Surgery*, April, 1936) had proved optimistic. If surgeons would be content to wait three years for their end-results they would be on safer ground.

The bad results of nailing are generally the results of bad nailing. This applies to reduction and to *x*-ray technique as well as to the nailing itself. It is so important to put the nail exactly where it is needed (generally axial in both planes) that I have discarded my director which gave mathematical precision with insufficient stability for one designed and made for me by Mr. Raymond Fox, which promises to fulfil both requirements. It may be asked how I can still label myself an advocate of nailing. The answer is (*pace* McMurray) that I believe it to be the best method so far discovered, but I confess that my own results—if I could bring myself to think of them in under three years—would remind me of the little girl who had a little curl right in the middle of her forehead.—I am, etc.,

London, W.1, April 4. ERIC I. LLOYD.

Multiple Benign Sarcoid and Tuberculous Ulceration

SIR,—I am surprised that the case reported by Dr. R. Howitt Wiseman under this heading on March 26 (p. 673) has evoked no discussion. It is a pity that the report was not accompanied by any clinical photographs or illustrations of the histological picture. If Dr. Wiseman's diagnosis and the interpretation of his findings is accepted, it must be regarded as solving the difficult problem of Boeck's sarcoid. On the evidence submitted I have great difficulty in accepting either his diagnosis or his interpretation of his findings. There is no mention of the Mantoux reaction or of *x*-ray investigation of the chest or of bone, all of which is of first importance in discussing the problem of sarcoid. If there is a microscopical picture typical of the benign sarcoid it is not that described in this case, and I think I should not be alone in questioning the value of bacteriological examination of scrapings from the edge of an ulcer to confirm the diagnosis of tuberculosis. It will be interesting to learn the further history of this case beyond the investigation stage, and to know whether the question of mycosis fungoides or allied affections was considered. I should have thought the diagnosis rested between this group and leprosy.—I am, etc.,

Leeds, April 2. JOHN T. INGRAM.

"Gonococcus Antitoxin" for Gonorrhoea

SIR,—It is with much interest that I have followed in your columns the papers by Dr. Anwyl-Davies and by Drs. Burke, Harkness, Gabe, and King in regard to the treatment of gonorrhoea with antitoxin. The difference in their results is most instructive.

All scientific workers would probably agree that the careful planning of an experiment so that it may at least be reasonably expected to prove or disprove that which it sets out to prove or disprove is the first essential towards obtaining a result of practical value. It would seem that whereas in the work of Drs. Burke, Harkness, Gabe, and King the method adopted was carefully thought out and suitably controlled with a particular end in view, that of Dr. Anwyl-Davies would appear to fall far short of this standard. Moreover, it seems that the former authors carried out their work entirely independently of each other, and only afterwards pooled their results—a fact which materially enhances the value of their experiments. In the case of Dr. Anwyl-Davies's work it is very difficult to determine what scientific method of approach was adopted or what bearing the results obtained have upon the efficacy or otherwise of the antitoxin in the treatment of gonorrhoea because of the "adjuvant treatment" which was given at the same time. What strikes one very forcibly is that the deductions made by Dr. Anwyl-Davies as a result of his work appear to be very much at fault.

Let us suppose that he had done his work in the light of the more recent experiments of Dr. Burke and his co-workers (and it would seem that it could only be of some value *after* these experiments); one would have expected his deductions to confirm in some degree, and not confound, the findings of these workers. Here are two sets of workers, one using antitoxin together with a recognized modern method for the treatment of gonorrhoea (called "adjuvant"), and the other using antitoxin alone; one set of experiments yields good results and the other bad results. The deductions are, of course: (1) that the "adjuvant" is most likely responsible for the good results, since it is the only important thing that is not common to all the workers; and as a corollary to this (2) that the antitoxin has no beneficial effect in the treatment of gonorrhoea—as Drs. Burke, Harkness, Gabe, and King suggest. Furthermore, in a number of their cases severe local and general reactions were noticed, whereas in Dr. Anwyl-Davies's work these were by no means such a formidable feature; again the "adjuvant" probably explains the discrepancy. The deduction here is that not only is the antitoxin of no benefit, but in a number of cases it would appear to be positively harmful—again as suggested by Dr. Burke and his co-workers. Finally, it would be interesting to know whether or not Dr. Anwyl-Davies used prontosil or some allied substance in some or all of his cases "by way of adjuvant."—I am, etc.,

N. SEDDON-TAYLOR, M.B., Ch.B.

London, W.2, April 10.

Use of Measles Serum in a School

SIR,—On January 18, 1938, the spring term began, and on January 20 information was received that the sister of a boy in the school had that day developed measles. This boy was at once removed to the sanatorium, and on the same day showed signs of measles. Consultations between the head master and medical officers produced the information that there were in the school thirty boys who had not

had measles. This small number was due to the fact that there had been an epidemic of measles in the school two years before. Of this number there were five who were +++ contacts, a + standing for dormitory, house, or form contact. These were at once segregated, and it was decided to attempt control of what might prove to be an epidemic by the use of measles serum. While permission was being sought and obtained from the parents of the contacts, adult serum was, with considerable difficulty, obtained, largely through the help and interest of Dr. E. M. Darmady, assistant pathologist, Salisbury. Each of the contacts was given 10 c.cm. adult serum. Incidentally, the parents of one boy who was not a contact and had not had measles asked for inoculation. After an interval of nine days new cases reported, and this continued until a total of sixteen boys came under treatment. Of this number six were boys who had serum. The epidemic was not of a severe type.

The main object of this note is to stress the advantage of using measles serum. The clinical contrast during the course of the disease was most spectacular. The patients who had serum were never ill. The rash was at no time fully developed. Its distribution was very uneven, and I found it lasted longer. There was an entire absence of coryza and photophobia. Laryngeal and bronchial symptoms were negligible. The average period of pyrexia was two days. In the case of the uninoculated patients it was five days. There was no complication of any kind in the boys who had serum, and it will certainly be recommended in any future outbreak. The injection of the serum produced no reaction. The injections were always given in the evening, and each boy was instructed to stay in bed next morning if he did not feel quite fit. In no case did he take advantage of this; he got up and did full justice to a good breakfast.

As will be noted from the above remarks there is no evidence of temporary immunity, but there is undoubted evidence of attenuation of the disease and absence of complications. With such a strong weapon now added to the equipment of the physician it is hoped there will be in the immediate future provision made for the speedy supply of serum for the needs of the community.

I gladly acknowledge the helpful assistance of Sir Kaye Le Fleming in interview and correspondence.—I am, etc.,

W. J. GRAY, L.R.C.P., L.R.C.S.

Littleton Panell, Wilts, March 31.

Unequal Pupils in Unconvicted Prisoners

SIR,—As more than once I have had occasion to relieve doctors' worries about unequal pupils occurring not only in their patients but in themselves, it seems desirable to comment upon the statement by Dr. H. K. Snell and Dr. G. A. Cormack (*Journal*, March 26, p. 672) that "anisocoria associated with changes in the pupillary reaction invariably indicates a definite organic lesion and is often accompanied by other signs of the disease." That it can indicate such a lesion is common knowledge, but Adie showed some years ago that dilated and inactive pupils can even be associated with absence of knee-jerks and yet be a benign condition. Of course, there may be an organic lesion to explain the syndrome, but I am not aware that it has been discovered, and for the peace of mind of the sufferers the term "functional" had better be used to describe the phenomenon. For many years I have been making observations upon anisocoria, and have come to the conclusion that in ophthalmic practice a common cause is emotional stress. I published in this *Journal* notes of a case illustrating how such stress could work even at long range (1925, **2**, 1179). Long before that Professor Millais Culpin had told me of the occurrence of unequal pupils in his shell-shocked patients.

Dr. Snell and Dr. Cormack in their article state that "none of our cases showed evidence of mental disorder associated with anisocoria." The value of this observation depends upon the definition of mental disorder. It has long been my custom to regard pronounced inequality of the pupils, especially when of sudden onset, as a sign of an anxiety state, an all-too-common mental disorder. Is it not significant that "in many cases the inequality noted overnight was no longer present at the second examination the following morning"? The suggestion that "fatigue was the determining factor" seems an inadequate explanation without qualification as to the nature of the fatigue. Since the state of mind of most offenders while wondering what fate awaits them must be the most exhausting process they undergo, I presume that the authors refer to mental and not physical fatigue. Is not the situation comparable to that of soldiers waiting to go "over the top"? In the 50 per cent. of cases that recovered after a night's rest some adaptation to evil circumstances may be assumed. "To sleep upon it" is a well-known way of settling conflict and securing peace of mind. But I think that an experienced psychologist would have little difficulty in showing temperamental differences between those who recovered so quickly and those whose nervous system had received a more lasting impression. Direct official questioning about feelings is not likely to get at the truth. Just as in the great war soldiers would not admit fear, so may unconvicted prisoners repress emotion. But as is shown by the traditional custom in India of detecting criminals by giving suspects a mouthful of rice and noticing which of them failed to insalivate it, the nervous system has its own way of revealing emotional secrets. A case in point may perhaps be quoted.

A man, aged 30, came to me on December 10, 1928, with a widely dilated right pupil, virtually inactive to light and accommodation; the left pupil was normal. His sight for distance and reading was unimpaired. The day before he had got a flake into his eye from his brother's wireless battery. He was frightened for a few minutes, but the eye soon became comfortable, and it was not until he returned to his own home four hours later that he learned from his mother that his eyes looked "odd." I asked a colleague sceptical of my views to explain the phenomenon on purely physical lines. He failed, and I undertook to explain it from the emotional point of view. As I pointed out in 1925, and again in 1935, grief can cause such a lesion, and I began now by asking the patient if his father or mother had just died. He replied, "No, but my father lay dying in hospital yesterday morning." And then with great rashness I offered to tell the rest of the story. I said, "You wanted to listen to the morning bulletin about King George's health yesterday, and were preparing the wireless set for that purpose. You were very anxious, for, while you contemplated the King's apparently losing struggle for life, in spite of the attentions of many eminent physicians, you were thinking with a sinking heart how little chance your father had in a small cottage hospital. I should not be surprised to learn that your father had the same disease as the King." The guess was right, even to the last particular: his father had an empyema and was not expected to live through the day; actually he recovered. At this point my colleague, half convinced, urged: "But you maintain that when the dilatation is monocular it is usually on the left side; here the right eye is affected." To which I replied, "My experience is limited, but if you ask the patient you will find he is left-handed. He has merely changed sides." Again the guess was right. Audacity has its uses. The pupil slowly recovered in the next few weeks, and a month later was normal.

My patient had other symptoms indicative of a neurotic disposition. He suffered from depression, easily disturbed sleep, claustrophobia, fear of the dark, hay fever, and nervousness when riding on a bicycle or in a motor car. The vasomotor disturbances so commonly associated with these symptoms were manifest in his cold, clammy, bluish-red hands. Occasionally, even in summer, and especially at meal-times, his fingers and toes would become white and "dead." Several years later, when investigating the psychogenesis of patchy erythema of the face and neck, I asked this same patient to come for a further examination. His pupils were then normal, but he had a pale face and very red ears and neck. With the psychological significance of "getting it in the neck" in my mind, I used a stock inquiry and asked, "How do you react to anything rather tight, like a scarf or collar, round your neck?" He replied, "I awake at night fairly often with a sensation as if someone had a piece of rope round my neck and was gradually tightening it. When it becomes really tight I awake in a great fright and call out. My parents often hear the cry." He was indeed "getting it in the neck" in his dream life, and I was not surprised when, in answer to my next question, he said, "I never read detective tales: they are not even allowed in the house." If such a man were ever in the plight of an unconvicted prisoner he would not be amongst those whose pupillary inequality adjusts itself in a single night.

The very word "pupil"—from *pupilla*, a ward or minor—arouses curiosity as to why the opening in the iris was thus named, and the literal meaning of belladonna—beautiful lady—shows the strange emotional value attached to larger pupils, even when artificially induced. Can any useful conclusions as regards guilt be drawn from emotionally determined inequality of the pupils? I cannot say as far as conscious guilt goes. A tough lag might not bat an eyelid or dilate a pupil anyhow; it might be different if a conscience-stricken elder of the kirk were suddenly called upon to declare, in a police court, whether he had really been his brother's keeper or not. My patient, I feel sure, was a thoroughly worthy citizen, but one equally worthy once said, when watching a felon being taken to execution, "There, but for the grace of God. . . ."—I am, etc.,

Portsmouth, April 3. W. S. INMAN.

Abuse of Ephedrine

SIR,—In Professor J. H. Gaddum's interesting article on ephedrine, appearing in the *Journal* of April 2 (p. 713), I notice that he states that this drug is "having rather a vogue for local application to the nose, where it produces vasoconstriction and dries up secretions."

For many years I have regarded this drug as being one of the most dangerous decorations of the average bathroom shelf. It appears in various forms of gaudy bottle, complete with nasal dropper, and is advised in all forms of nasal congestion. The contents give temporary relief in acute coryzal congestion. Such relief is sought by the patient repeatedly, and secretions are kept dried up. Inflammation of the antrum is the usual end-result. This may certainly be mild and transitory, but frequently is more serious, the degree of damage being to a certain extent proportionate to the number of applications of the contents of the dropper.

I consider that it is the ephedrine content of the oily emulsions which should be banned from the treatment of acute coryza. I speak from the observation of innumerable cases seen in general practice, and I should be interested to hear whether it receives the confirmation of other practitioners.—I am, etc.,

Maidenhead, April 5. R. R. FOOTE, M.R.C.S., L.R.C.P.

Food Supplies and Defence

SIR,—You kindly published in your issue of May 23, 1936 (p. 1079), a letter of mine indicating the possibility and urging the necessity for this country of self-sufficiency in essential foods. True there has been some movement in this direction, for which we may be thankful to the Government; but it has been perilously slow, and now, with a situation abroad more menacing to this country than any since 1918, it is manifest there is widespread apprehension of defeat through starvation in the event of war. In my opinion it is unwise to count on assistance from beyond the confines of the British Empire, if not, indeed, from beyond the shores of Britain. Armaments alone are inadequate. However gigantic they may be panic as to the inadequacy of our food supplies may still be inevitable unless we hasten to assure our home supplies.

I invite a reference to the report of the Committee on Nutrition, issued by the British Medical Association in November, 1933. Page 12 contains: "Table II.—Daily Requirements of an Adult Male in Calories, Protein, Fat, and Carbohydrates." These are:

First-class protein	50 grammes
Second-class protein	50 ,,
Fat	100 ,,
Carbohydrate	500 ,,

The second-class protein and some of the fat can be supplied by cereals, as the table shows. If only by reason of the certain lack of shipping in the event of war, surely it has been folly not to produce the carbohydrates from the home soil, as that soil can produce all we need. Every million pounds spent on cereal production will obviate the spending of ten times as much on armaments. Page 24 of the B.M.A. report gives: "Diet No. 3.—Adult Ration. No Meat or Fish," and it is stated: "This diet has been devised to enable those persons who object to eating flesh foods to obtain a diet which is satisfactory as regards its constituents. The first-class protein in this diet is derived from milk and cheese. The cost is approximately the same as that of the preceding diet." As an acre of land when used for dairy farming produces at least twice as much first-class protein and fats as when producing meat, it is astonishing that at the present juncture the Government should encourage meat production, especially as, without such encouragement, there would still be ample meat when the land is producing essential foods.

The Government appears to be averse to formulating and enforcing an agricultural policy that will assure us against starvation in war time. I venture to submit this policy must be one that is in normal operation in time of peace, and that assures essential foods with the minimum of labour cost, thus setting free the maximum number for active service in the event of war. Maybe it is but envisaging this policy from another aspect to say a national policy should aim at the maximum population that can be supported in health on the produce of the home soil. This is the policy of Germany and Italy. It is, indeed, the policy on which the sages of all religions have been agreed. It has no place for our so-called high standard of living, advocates of which are generally also advocates of a restricted population. Britain can support in health double its present population on the produce of its own soil: had it that population at the present moment we should be living free from all apprehension of war!—I am, etc.,

London, W.14, April 5. E. BATCHELOR, I.C.S.(ret.).

Chemotherapy of Virus Diseases

SIR,—In view of the number of different bacteria which are influenced by prontosil, sulphanilamide, and allied compounds, it is only natural that the effect of these drugs should have been tested on virus infections. Although a number of workers have obtained negative results in virus diseases, Rosenthal, Wooley, and Bauer (1937) claim to have influenced lymphocytic choriomeningitis infections in mice with prontosil rubrum. Employing two strains of the virus of lymphocytic choriomeningitis isolated in this country, and employing the same technique as the American workers, we have failed entirely to influence this infection in any way with prontosil rubrum. These results are in agreement with those recently published by Ronse (1938) and Levaditi (1938). Yellow fever infections in the monkey and mouse and Rift Valley fever in the mouse have also been unaffected by prontosil and allied drugs. A fuller account of these experiments will be published in due course.—We are, etc.,

G. M. FINDLAY
F. O. MACCALLUM.

The Wellcome Bureau of Scientific Research,
London, N.W.1, April 11.

Sodium Sulphanilyl Sulphanilate and Canine Distemper

SIR,—Since the appearance of the paper by Dochez and Slanetz (*Science*, 1938, **87**, 142), in which they reported their observation that sodium sulphanilyl sulphanilate was of value in the prevention and treatment of canine distemper, a number of veterinary practitioners have inquired as to the effect of this drug. A considerable number of experiments have been completed in these laboratories, and our results are not in parallel with those described in the American publication. In our hands this drug has not influenced the course of infection with the Carre-Laidlaw-Dunkin distemper virus either in ferrets or in dogs. At present we know of no obvious explanation for this complete discrepancy, and we hope at an early date to publish the details of our experiments.

The above drug should not be confused with sulphanilamide, which in our preliminary experiments appears to have little or no influence on the course of infection with the distemper virus, but does seem to control the secondary infections.

We are in communication with Dr. Dochez, but in view of the interest which has been aroused by the original paper, commented on in the *Journal* of April 9 (p. 791), felt that a short note of our results would be of interest.—We are, etc.,

A. B. MACINTYRE
R. F. MONTGOMERIE.

Wellcome Physiological Research Laboratories,
April 10.

Smoking and Longevity

SIR,—In your annotation on this subject in the *Journal* of April 9 (p. 791) you appear to be in some doubt as to the existence of an anti-tobacco league. May I lighten your darkness by informing you that a "National Society of Non-Smokers" was founded in 1926, with an organ entitled "Clean Air." The aim of the society is "the maintenance of the right of every non-smoker to clean air, unpolluted by tobacco smoke, in which to take his or her food, to travel, to do business, or to seek entertainment." Further information about this society, which numbers over 1,300 members, may be obtained from the secretary, 20, Essex Street, W.C.2.—I am, etc.,

London, W.8, April 9. J. D. ROLLESTON.

Obituary

Dr. DAVID EDWARD RICHARDS, who has died at his residence in Tondu, near Bridgend, South Wales, received his medical education at Anderson College, St. Mungo's College, and the Western Infirmary, Glasgow. In 1892 he took the triple Scottish Diploma, L.R.C.P., L.R.C.S.Ed., and L.R.F.P.S.Glas., and ten years later proceeded to the Fellowship of the Royal College of Surgeons of Edinburgh. He practised near Bridgend and was surgeon to the cottage hospital there, consulting surgeon to the Great Western Railway, and medical officer and public vaccinator. He was also a medical officer to the Post Office and the Board of Education, as well as to various assurance societies. He joined the British Medical Association in 1901.

Mr. EDWARD JOSEPH FOX of Warrington died on March 31 at the age of 65. Born in Warrington in 1873, the son of the late Dr. Edward Austin Fox, he was at Stonyhurst College from 1885 to 1890, when he went to Owen's College, Manchester, and later to St. Bartholomew's Hospital. In 1894 he graduated B.Sc.Lond. with honours in physiology, and three years later obtained the diplomas M.R.C.S., L.R.C.P. He proceeded F.R.C.S.Eng. in 1899. He held the posts of house-surgeon to Manchester Royal Infirmary, Manchester Southern Hospital, and Salford Royal Hospital. Having determined to specialize in diseases of the eye, he became clinical assistant to the Royal London Ophthalmic Hospital, and subsequently began to practise in Warrington, where he was appointed ophthalmic surgeon to the Royal Infirmary. He was a member of the North of England Ophthalmological Society and joined the British Medical Association in 1911.

Dr. JAMES GODDING, O.B.E., died on March 31 at his residence in Worthing, aged 74. He received his medical education at the London Hospital, and obtained the diplomas M.R.C.S., L.R.C.P. in 1889. After a period of general practice, and having been medical officer for the London District to the Corporation of Trinity House, he became in 1896 medical officer to the London and India Docks Joint Committee and medical examiner to the Shipping Federation and various steamship lines. In 1907 he was appointed deputy coroner for the eastern division of the County of London, and then joined Gray's Inn, being called to the Bar in 1911. In 1898 Dr. Godding held the commission of surgeon lieutenant in the 15th Middlesex Regiment, which was a volunteer corps recruited from the staffs of the docks companies and H.M. Customs in the Port of London. He subsequently transferred to the combatant corps, which eventually became the 17th London Regiment in the Territorial Army. He was in command of this regiment at the outbreak of the last war, and was on active service with it in France and Egypt until 1917, when he transferred to the Royal Army Medical Corps, and as lieutenant-colonel was in charge of No. 17 General Hospital, E.E.F. He was mentioned four times in dispatches. In 1920 he became full-time medical officer to the Port of London Authority; he was a member of the B.M.A. Ship Surgeons Subcommittee from 1919 to 1920. On his retirement from the Port of London Authority in 1930 he received a presentation of silver plate, and the value of his work was very highly commended. He held the Territorial Decoration.

Dr. JAMES W. PUTNAM, neurologist, who was expert witness for the State at the trial in 1901 of Leon Czolgosz, *alias* Fred Nieman, assassin of President William McKinley, died at Buffalo, New York, on March 23, aged 77.

Dr. LOUIS WILLIAM STERN, since 1934 professor of psychology at Duke University, Durham, North Carolina, and formerly of Breslau and Hamburg, died on March 27, aged 67. He originated the concept of the I.Q. (Intelligence Quotient), which is so popular in the U.S.A.

Medical Notes in Parliament

The House of Commons rose for Easter on April 14. It is due to reassemble on April 26, when the Budget will be opened.

The Housing (Agricultural Population) (Scotland) Bill was read a second time by the House of Lords on April 7. On the same day the Lords read the Army and Air Force (Annual) Bill. Lord Strathcona and Mount Royal pointed out that Clause 6 of this Bill abolished an obsolete class of "hospital apprentice" in India.

On April 6 the House of Commons supported a motion brought forward by Mr. Roland Robinson advocating the even distribution of holidays through the summer months and calling on the Minister of Education and the Minister of Labour to consult together with a view to eliminating obstacles to this. Sir Henry Morris-Jones, speaking as a medical man who had practised in a seaside resort, said it was pernicious that the holiday season should be concentrated into one month of the year. In the same debate Mr. Chuter Ede and other speakers advocated altering the season at which the academic year began at universities and schools. Mr. Ernest Brown said the co-operation which was advised between his Department and the Board of Education would be assured. Mr. Robinson then withdrew his motion.

On the same day the House nominated six members to join with six Peers in a Joint Select Committee on the Collecting Charities (Regulation) Bill.

When the House of Commons read the Patents, etc. (International Conventions), Bill a second time on April 8 Captain Wallace said one clause gave effect to amendment in the international agreement for the prevention of false indications of origin on goods, as revised in 1934. By this change the agreement covered the use of all indications in the nature of publicity capable of deceiving the public as to the origin of the goods and appearing not only on the goods themselves but on signs, advertisements, business letters, or any other commercial communications.

Dr. Edith Summerskill took her seat in the House of Commons on April 11 as member for West Fulham, in the room of the late Sir Cyril Cobb. She was introduced by Sir Charles Edwards and Sir Stafford Cripps.

Sir Francis Fremantle has been appointed to the Select Committee of Lords and Commons on the Food and Drugs Bill.

Reference books on medicine and medical jurisprudence have been added to the library of the House of Commons. The lack of these had been remarked by the Parliamentary Medical Committee.

Infanticide Bill

Viscount DAWSON OF PENN moved on April 7 that the House of Lords resolve itself into a Committee on the Infanticide Bill, to which the House had on March 22 unanimously given a second reading. He interpreted that manifestation of opinion as meaning the House felt that if it was once proved in court that a defendant was not responsible for her actions by reason of the state of her mind at the time of the offence, the possibility should be removed of that defendant being exposed to a possible charge of murder, to a verdict of "guilty" of murder, or, as an alternative, to "guilty but insane." Either of those verdicts denied the principle of the Bill. He had hoped to put this question beyond all doubt by two simple amendments in committee. He had hoped in this Bill to make clear that when a court of assize had satisfied itself that a defendant was irresponsible by reason of the then state of her mind, it would be possible to return a verdict of "insane at the time, therefore not responsible, therefore not guilty," a form of verdict in vogue before an Act of 1883. Lord Atkin's committee had unanimously recommended fifteen years ago that there should be a reversion to the old form of verdict. Lord Dawson said he had consulted his legal friends, who favoured an alteration of the law, but said it should not be altered for this group of cases only. In many other cases of irresponsibility they would wish to go back to the verdict of "insane at the time, therefore not guilty." These legal friends were firmly of opinion that it would be better to bring in a separate Bill, to which they would be favourable. He must bow to this opinion, although he did so with great regret.

The ARCHBISHOP OF CANTERBURY said he shared Lord Dawson's disappointment at finding it was not possible to introduce the suggested amendment in this Bill. It would be well if early legislation were brought in to give effect to the recommendations of Lord Atkin's committee. The EARL OF MUNSTER, on behalf of the Government, said he would convey to the Home Secretary the views that had been expressed.

The House then went into committee on the Bill and agreed without debate to amendments proposed by Lord Dawson. By these a recently born child is defined to be a child under the age of 12 months, and the circumstances for applying the provisions of the Bill to a mother were defined as being that "the balance of her mind was disturbed by reason of her not having fully recovered from the effect of giving birth to the child or by reason of the effect of lactation consequent upon the birth of the child." A further amendment was accepted to provide that the Infanticide Act, 1922, be repealed. The long title of the Bill was amended so that the phrase "a woman who wilfully causes the death of her child" no longer appears in it.

The report stage was set down for April 12.

Measles Serum

Mr. W. LEACH asked on April 7 whether disappointing results had followed the recent use of measles serum in London County Council hospitals. He asked for strict investigation of the claims made for the various serums in use, in view of recent criticism of a medical officer of health in regard to the employment of measles serum. Sir KINGSLEY WOOD replied that special reports published by the London County Council on the epidemics of 1931–2 and 1933–4 stated that both convalescent and adult measles serum had proved of great value. The report on the epidemic of 1935–6 had not yet been published, but there was no diminution of confidence on the part of this authority in the value of the serum. There would not appear to be grounds for a special investigation.

Hospital Appointment in Seychelles.—On April 4, Mr. KELLY asked the Secretary of State for the Colonies if he had considered a petition asking that a doctor, not a dentist, should be appointed to the Government hospital in the Isle of Seychelles. Mr. ORMSBY-GORE said that a petition was addressed to him last November protesting against the employment of a Government dentist at the Government hospital in the Seychelles. The petition contained no reference to the appointment of a doctor. He did not see his way to intervene.

Health Insurance Benefits in Incurable Illness.—On April 5, Mr. PARKER asked the Minister of Health whether he proposed to use the national health insurance funds to give increased benefits to those disabled by incurable illness. Mr. BERNAYS replied that provision was already made under the scheme of national health insurance for persons who were insured under the Acts at the time when they became disabled. Such persons, as soon as they had paid 104 weekly contributions, became entitled to disablement benefit up to the age of 65, and thereafter to an old-age pension for the rest of life. Any approved society which had a disposable surplus on valuation might apply part of it to increasing the standard rate of disablement benefit, and societies covering a high percentage of the whole insured population had, in fact, done so.

Contributory Hospital Scheme for Government Staffs.—Colonel COLVILLE announced on April 6 that a scheme would be made available to all Government staffs at home, industrial

and non-industrial, to make contributions for hospital purposes. The non-industrial staff numbered approximately 370,000.

Tuberculosis Inquiry in Wales.—Mr. BERNAYS, replying to Mr. J. Griffiths on April 11, said that a committee, of which Mr. E. C. Davies was chairman, had not yet completed its inquiries into the problem of tuberculosis in Wales. It proposed to hold a further sitting towards the end of this month. The Minister of Health would consider the question of the publication of the report as soon as he received it.

Health of Abyssinian Refugees.—The number of Ethiopian refugees in Kenya is 6,181. In a report prepared at the end of October last by the medical officer in charge of the camp it was stated that as a result of measures taken by the authorities in Kenya a great improvement had taken place in the health of the refugees, especially of the children.

Notes in Brief

During the year ended March 31, 1937, thirty-eight pedestrians were killed and 1,778 injured in Great Britain while crossing the road at junctions where traffic lights are installed.

The scheme for giving additional nutritive foodstuffs to expectant and nursing mothers in the special areas is being followed with the closest attention by the Medical Research Council and by the Minister of Health, but must, in the opinion of the latter, be regarded as in the experimental stage. The Minister is not in a position to make any general statement upon the results obtained.

The Government cannot provide special facilities for the Contraceptives Bill during the present session.

Returns received from 1,271 local authorities in England and Wales show that during the seven years ending on that date 621,578 houses had been reconditioned under the Housing Acts, 1930 and 1936, in the areas of those authorities.

Slum clearance programmes of the local authorities outside London affect some 387,000 houses. Of these about 240,000 have been included in clearance and demolition orders. Up to the end of last year about 150,000 of these houses had been demolished and about 161,000 new dwellings provided for persons so displaced.

The Services

AUXILIARY R.A.M.C. FUNDS

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 5.15 p.m. on Friday, April 29, at 11, Chandos Street, Cavendish Square, W., when the annual report and financial statement for the year ended December 31, 1937, will be presented and the officers and committee for the current year elected.

No. 4 FIELD AMBULANCE OLD COMRADES' ASSOCIATION

Staff Sergeant J. MCKEOWN, R.A.M.C., writes from 90, Ashurst Road, North Finchley, N.12: As organizer of the reunion and dinner of the above unit I am desirous of getting in touch with all the officers who served with the unit during 1914-19. Will any officer who has not heard from me please communicate with me at the above address? I should also be pleased to hear from any medical officer who served with the No. 3 or No. 9 Field Ambulance or in the Guards Division.

DEATHS IN THE SERVICES

Major DANIEL MCKELVEY, M.C., R.A.M.C., died recently in the Queen Alexandra Military Hospital, Millbank, London, aged 46. He was born on September 5, 1891, the elder son of John H. McKelvey of Dunbunraver, Gortin, Co. Tyrone, and was educated at Edinburgh University, where he graduated M.B., Ch.B. in 1913. He proceeded M.D. in 1919. He also studied at St. Mary's and Guy's Hospitals, and took the F.R.C.S. in 1927. After filling the posts of resident house-surgeon at Edinburgh Royal Infirmary and at the Dreadnought Hospital, Greenwich, when the war began he took a temporary commission as lieutenant in the Royal Army Medical Corps. On November 1, 1914, he became temporary captain, took a permanent commission in that rank on May 1, 1918, and became major on November 1, 1926. He served throughout the war of 1914–18, when he gained the Military Cross and later two bars to the Cross, also the French Croix de Guerre, with palm leaves. He was once taken prisoner, but escaped. After the war he served in Egypt, Hong Kong, and India. He gained the Alexander Memorial Prize and gold medal at the Royal Army Medical College in 1923. He was unmarried. He had been a member of the British Medical Association since 1915, and from November, 1931, to February, 1933, was president of the Hong Kong and China Branch.

Universities and Colleges

UNIVERSITY OF OXFORD

The George Herbert Hunt Travelling Scholarship for 1938 has been awarded to W. E. Gibb, B.M., of Oriel College.

UNIVERSITY OF LONDON

Recognition of Teachers

The following have been recognized as teachers of the University in the subjects indicated in parentheses:

University College: Dr. Matthew Young (Anatomy).

St. Thomas's Hospital Medical School: Dr. Evan Jones (Medicine).

Westminster Hospital Medical School: Mr. E. S. Lee (Surgery).

London (Royal Free Hospital) School of Medicine for Women: Dr. F. P. Lee Lander (Medicine).

University College Hospital Medical School: Dr. M. W. P. Hudson (Anaesthetics); Dr. A. J. Morland and Dr. E. A. B. Pritchard (Medicine); and Mr. S. G. Suggit (Oto-rhino-laryngology).

M.B., B.S. Examination: Amendment of Regulations

New regulations for internal and external students will come into force in and after the session 1938-9, but up to and including May, 1940, internal and external students are permitted to proceed to the M.B., B.S. degrees either under the present regulations or under the revised regulations.

Presentation Day

The ceremony of presentation for degrees will take place at the Royal Albert Hall on Wednesday, May 11, at 2.30 p.m., and at 5.30 p.m. the same day the annual service for members of the University will be held at St. Paul's Cathedral, when the preacher will be the Right Rev. Ernest Morell Blackie, Dean of Rochester. Applicants for tickets should enclose a stamped addressed envelope, and state their sex, and whether they are teachers in the University, graduates (giving degrees), or undergraduates.

Lectures

A lecture on "Comparative Histophysiology of the Vertebrate Nephron" will be given by Dr. Pol Gérard, professor of histology in the Université Libre de Bruxelles, at King's College, Strand, W.C., on May 4, at 5.30 p.m. The chair will be taken by Dr. F. R. Winton.

Dr. J. W. Trevan will give a course of three lectures on "Variation in the Response of Animals to Drugs" at the Wellcome Institute for Medical Research, Euston Road, N.W., on May 23, 24, and 25, at 5.30 p.m. At the first lecture the chair will be taken by Sir Henry Dale, F.R.S.

A public lecture on "Some Aspects of Heart Sounds in Normal Pathological Conditions" will be delivered by Dr. E. Braun-Menendez of the Institute of Physiology in the Faculty of Medical Sciences, Buenos Aires, at University College, Gower Street, W.C., on Tuesday, May 3, at 5 p.m.

UNIVERSITY OF MANCHESTER

On Founder's Day, May 18, the honorary degree of Doctor of Science will be conferred on Sir Henry Dale, M.D., F.R.S., who was unable to attend to receive it last year.

No. 13

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 2, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 125 great towns (122 in 1937) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns (9 in 1937) in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	32	6	12	3	—	24	4	7	3	1		
Deaths		1	4				3	1				
Diphtheria	1,388	144	239	76	38	926	119	181	46	33	1,053	157
Deaths	25	5	6	3	1	26	4	7	7	2		
Dysentery	111	21	54		—	9	2	9		—		
Deaths			—	—	—			—	—	—		
Encephalitis lethargica, acute	13	—	—		—	3	—	1		—		
Deaths		1	1				—	1				
Enteric (typhoid and paratyphoid) fever	8	1	6	2	3	16	2	6	3	4	20	—
Deaths	—	—	1	—	—	2	—	—	—	—		
Erysipelas			70	3	5			78		7		
Deaths		3	—				1	1	7			
Infective enteritis or diarrhoea under 2 years												
Deaths	33	14	9	7	3	47	14	9	6	2		
Measles			1,421		63*			174		4		
Deaths	38	12	19	2	8	23	—	1	2	—		
Ophthalmia neonatorum	105	13	31	1	—	108	7	22		1		
Deaths												
Pneumonia, influenzal §	1,205	120	14	5	23	1,337	101	20	7	8	1,394	163
Deaths (from Influenza)	74	13	5	1	1	101	17	6	10	5		
Pneumonia, primary			211	12				241	10			
Deaths		29		21	13		23		22	15		
Polio-encephalitis, acute	3	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	4	—	—		—	4	1	1		—		
Deaths		—	—				—	—				
Puerperal fever	8†	8	21	2	1	27	1	24	3	—		
Deaths		3‡					—					
Puerperal pyrexia	190	25	33		1	110	6	26		2		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths								—				
Scarlet fever	2,323	188	367	88	69	1,661	176	352	84	24	2,087	239
Deaths	5	—	6	—	1	5	1	—	1	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—	—	—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—		—		
Deaths			—	—	—			—	—	—		
Whooping-cough			85		12			401		2		
Deaths	28	4	4	1	1	31	8	25	4	—		
Deaths (0-1 year)	357	64	78	52	24	456	73	97	46	20		
Infant mortality rate (per 1,000 live births)	59	52				76	61					
Deaths (excluding stillbirths)	4,720	916	698	239	155	5,517	1,107	769	278	156		
Annual death rate (per 1,000 persons living)	11.6	11.5	14.2	16.1	13.7	13.7	13.8	15.7	19.0	14.9		
Live births	6,739	1,323	934	392	216	6,126	1,150	1,050	329	227		
Annual rate per 1,000 persons living	16.6	16.7	19.1	26.5	19.1	15.2	14.3	21.5	22.4	21.7		
Stillbirths	290	42				274	38					
Rate per 1,000 total births (including stillborn)	41	31				43	32					

* 60 cases in Belfast alone.
† After October 1, 1937, puerperal fever was made notifiable only in the Administrative County of London.
‡ Deaths from puerperal sepsis.
§ Includes primary form in figures for England and Wales, London (Administrative County), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Diphtheria and Scarlet Fever

The incidence of diphtheria in England and Wales and in London showed a slight fall compared with the previous week. On the other hand slight increases in notifications were recorded in Scotland, Eire, and Northern Ireland. Fewer deaths were reported in the 125 Great Towns, including London, and in the sixteen principal towns of Scotland; in Eire deaths rose from 1 to 3, and in Northern Ireland 1 death each week was recorded. There was a slight rise in the notifications of scarlet fever in England and Wales, Scotland, and Eire, and a slight fall in London and in Northern Ireland.

Pneumonia

There were slightly fewer cases of pneumonia (influenzal and primary forms) in England and Wales, and the figures are considerably less than in the corresponding week last year and than the median value for the last nine years. There were fewer deaths from influenza in the 125 Great Towns compared with the previous week, while in London itself there was an increase (from 9 to 13). In all the towns or groups of towns from which figures are available there was a decided increase in deaths from influenza, compared with the corresponding week last year. Although influenza has not been observed in epidemic form either in Europe or in the U.S.A., a number of mild outbreaks have been reported in Switzerland, Hungary, and Denmark, as well as a slight increase in influenza mortality in the towns of Germany and of England and Wales.

Measles and Whooping-cough

In the 125 Great Towns there were 38 deaths from measles, compared with 67 in the previous week; of these, 12 (23) occurred in London, 3 (5) in Liverpool, 4 (3) in Manchester. The figures in parentheses denote the deaths in the previous week. The London epidemic appears definitely to have passed its peak: 2,095 cases were reported from the L.C.C. elementary schools, compared with 2,477 last week, and the average daily admissions to the L.C.C. fever hospitals dropped from 103 to 92. The number of cases of measles under treatment in the L.C.C. fever hospitals on April 1 was 2,339, compared with 2,284 on March 25 and 2,079 on March 18. The increase of cases under treatment is likely to be maintained for a week or two, as severe and complicated cases may remain in hospital for several weeks. On April 1 there were under treatment in the L.C.C. fever hospitals 1,128 (1,182) cases of diphtheria, 838 (844) cases of scarlet fever, 307 (312) cases of whooping-cough. The figures in parentheses refer to the numbers in the previous week. Notifications in the eleven metropolitan boroughs in which measles is notified were, for the week ended April 2, 1,113 (1,315), distributed thus: Battersea 144 (136), Bermondsey 76 (94), Finsbury 30 (28), Fulham 77 (53), Greenwich 136 (112), Hampstead 47 (105), Lambeth 264 (322), St. Pancras 123 (171), Shoreditch 35 (38), Southwark 124 (202), Stepney 57 (54). The figures in parentheses denote the numbers for the previous week.

In Scotland 1,421 cases were notified, compared with 1,495 in the previous week: the figures for Glasgow were 692 (893), for Aberdeen 246 (210), Dundee 224 (132), Edinburgh 102 (78), Paisley 29 (51). The figures in parentheses refer to the numbers in the previous week. During the week there were in Scotland 19 deaths from measles, compared with 36 in the previous week: of these, 12 occurred in Glasgow; in the previous week there were 27 deaths in Glasgow and 1 in Edinburgh. In Northern Ireland there were 63 cases of measles, of which 60 were in Belfast alone, compared with 80 and 76 respectively in the previous week, while there were 8 deaths (all of which were in Belfast), compared with 12 in the previous week. During the week under review there were 2 deaths from measles in Eire, both in Dublin. The available figures appear to indicate that the incidence and mortality of measles are alike decreasing. Mortality from whooping-cough, on the other hand, seems to be on the increase; the deaths for the week were: 28 (13) in the Great Towns, 4 (1) in London, 4 (1) in Scotland, 1 (1) in the 13 principal towns of Eire, 1 (0) in the 10 principal towns of Northern Ireland.

Small-pox

In the week ended April 2 there were 162 cases of small-pox in Hong Kong with 112 deaths, compared with 131 cases and 131 deaths in the previous week. In Calcutta there were, in the week ended March 26, 208 (261) cases of small-pox with 161 deaths, and in Bombay 164 (212) cases with 100 deaths. The figures in parentheses denote the numbers for the previous week.

Typhus

In the week ended March 26 there were in Morocco 234 (372) cases of typhus with 14 deaths: of these, 82 (122) occurred in Marrakesh, 36 (78) in Casablanca, 21 (20) in Rabat, 6 (6) in Agadir. The figures in parentheses refer to the number of cases in the previous week. In the same week there were in Egypt 88 cases with 11 deaths, compared with 85 cases reported in the previous week. The disease appears to be widely spread, there being 32 cases at Qena, 12 at Giza, 3 at Cairo, and 3 at Alexandria.

Medical News

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, April 28, at 8.30 p.m., when a paper will be read by Mr. William Latey on "Medico-Legal Aspects of the Matrimonial Causes Act, 1937."

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, April 20, at 5.30 p.m., when papers will be read by Professor R. Ruggles Gates, F.R.S., on "The Structure of the Chromosome," and by Dr. Miles Johnston (communicated by Dr. J. A. Murray, F.R.S.) on "Some Methods of Preparing Fish Otoliths for Examination."

The planning of hospitals will be discussed at a sessional meeting of the Royal Sanitary Institute at the new Perivale Maternity Hospital, Western Avenue, Ealing, on Thursday, April 21, at 2.30 p.m. The discussion will be opened by Mr. L. G. Pearson, who will deal with the architectural aspect, and by Dr. James Ferguson and Dr. Thomas Orr, who will deal with general hospitals and maternity hospitals respectively. The chair will be taken by Professor J. M. Munro Kerr. Before the meeting, at 11.30 a.m., an inspection will be made of the hospital.

The annual Students' Club ball of the Charing Cross Hospital Medical School will be held on Tuesday, April 26, at Grosvenor House, Park Lane, W.

The annual congress of the Ophthalmological Society of the United Kingdom will be held at the Royal Society of Medicine, 1, Wimpole Street, W., on Thursday, Friday, and Saturday, April 28, 29, and 30, under the presidency of Dr. Gordon M. Holmes, F.R.S. The morning of the first day will be devoted to a discussion on differential diagnosis of the causes of exophthalmos; in the afternoon papers will be read; and in the evening the annual dinner of the society will take place at the Langham Hotel. The whole of the second day, from 10 a.m. to 10 p.m., will be given up to the reading of papers, with the exception of a demonstration by Mr. A. Sorsby. On April 30 papers will be read in the morning from 10 a.m.; the annual general meeting of the society will be held at 12 noon; and the proceedings will close with a visit to the General Post Office. Full particulars of the congress may be obtained from the secretary, Mr. L. H. Savin, F.R.C.S., 7, Queen Street, Mayfair, London, W.1.

In our advertisement columns this week the University of Durham and the Royal Victoria Infirmary, Newcastle-upon-Tyne, invite applications for the Professorship of Pathology tenable at King's College, Newcastle-upon-Tyne, concurrently with the post of Pathologist to the Royal Victoria Infirmary, Newcastle. The salary is £1,100.

We have been asked to draw the attention of readers to the notice in our advertisement pages this week inviting applications for various appointments to be made preparatory to the occupation of the new Hospital for Sick Children, Great Ormond Street, W.C.

The tenth International Congress of Chemistry, consisting of eleven sections, will be held at Rome from May 15 to 21.

A monument to Albert Calmette was unveiled at Nice on April 8.

The University of California Press, Berkeley, California, for which the Cambridge University Press is agent in Great Britain, announces the inauguration of *The University of California Publications in Pharmacology*, under the editorial supervision of Drs. Gordon A. Alles, T. C. Daniels, Mayo H. Soley, and Chauncey D. Leake. These studies will appear irregularly in the series, but will be consecutively paged to form volumes of about 500 pages. The subscription price is 22s. 6d. per volume. The first of these papers should appear early this spring, and it is expected that a volume will be completed about every two years. The studies will be produced in paper covers and printed in the usual style of the University of California Press monographs in series. The London headquarters of the Cambridge University Press are now at Bentley House, 200, Euston Road, N.W.1.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL, Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

An Internal Sanitary Pad

"G.P." writes: I should like to have the opinion of gynaecologists who have had experience of a new internal sanitary pad. Patients occasionally ask whether it can be recommended. I am afraid I rather hesitate to do so, as it seems to me a likely cause of uterine displacement. The forcing up of a firm pad against a cervix pointing either slightly forwards or backwards must surely accentuate any displacement, if not actually cause an ante- or retro-flexion. Particularly this is likely in the narrow vagina of an unmarried woman and in nulliparae.

Instrumental Midwifery

Dr. DAVID PRICE (Castle Cary, Somerset) writes: Is it true that the rising generation of accoucheurs are still taught that the use of forceps is anathema; that everything should be left to Nature until maternal exhaustion signs appear, just as it was inculcated forty years ago? A weightier young Briton is being produced in these days, and delay at the end of the first stage is the rule. Apart from maternal exhaustion a long-compressed infant may be a failure. Are we any more justified in such cases in waiting than we are in watching the progress of an inflamed appendix? In the large majority of cases labour can be hastened with complete benefit to all concerned by the proper use of forceps. Why then not teach and, more important still, demonstrate their use to students? A recent modification of "Barnes" has made their application more easy and more safe (especially, perhaps, to the aftercoming head), because the mobile blades, hinged to the handles, find the line of least resistance. The same hinged device then enables rotation of an occipito-posterior head and extraction at once because the handles can be swung forward, thus reversing the pelvic curve. In my practice, in the last two years, a few minutes have sufficed to deliver quite a number of district nurses' delayed cases by this manœuvre. The R.P.C. forceps are made by Messrs. Allen and Hanburys, and were illustrated in the *Journal* of September 11, 1937.

LETTERS, NOTES, ETC.

A Children's Classic

It is good to know that after a year's lapse *Bibliographical Notes and Queries* are now being published quarterly by Elkin Mathews of London and Scribner's of New York. There is an interesting note in the January number on the various editions of *Struwwelpeter*, which Heinrich Hoffmann-Donner (1809–94), head physician at the Hospital for the Insane at Frankfurt, wrote for the entertainment of his own children and which rapidly became a classic. The first English edition is described as an elusive book. Probably all early editions of *Shock-headed Peter* were printed in Germany with the English text to accompany the original lithographs, so that the English publishers were little more than agents. Until 1868 the illustrations were reproduced in hand-coloured lithography from Dr. Hoffmann's own drawings. Mr. Philip Hofer of New York owns a copy of the first Russian edition, which is dated 1848 and follows the fifth German edition. The inference is that the sale of five editions in three years tempted the publisher to embark on foreign translations and that the existence of an English edition before 1848 is doubtful.

Intermittent Hepatic Fever

Dr. W. LEES TEMPLETON (London, N.6) writes: Dr. Hutchison, in his book on diagnosis, advises one to think first of the common conditions before, for example, a calculus in the ampulla of Vater, but that the latter condition does exist should not be forgotten. The following case is offered as a possible example of this syndrome. A woman of 84 had a series of rigors with rise of temperature to 102° and 103° F., with upper abdominal pains and violent sweats, occurring every two to three weeks and lasting not more than twenty-four hours, with no symptoms at all during the intervening period. There was never any jaundice, and there was no bile, albumin, or pus in the urine. Between the attacks there were no very definite signs, though the gall-bladder region was somewhat tender and rigid. Ultimately these attacks occurred twice weekly, and she was taken into hospital. *X*-ray examination revealed a pathological gall-bladder, but she had no attack while under observation there. Her urine was still sterile. Operation, which was undertaken at her request, revealed a gall-bladder tightly packed with small stones, but her condition did not allow of more than a speedy incision of the gall-bladder, removal of as many of the stones as possible, and the insertion of a drainage tube. She survived the operation by a week, but died from heart failure. Though it was impossible to demonstrate a floating stone in the ampulla of Vater, I have no doubt that there was one. Tidy states that this so-called "intermittent hepatic fever" is the only cause, malaria excepted, of rigors occurring intermittently over a long period. Unless one remembers this syndrome the symptoms are liable to be extremely puzzling.